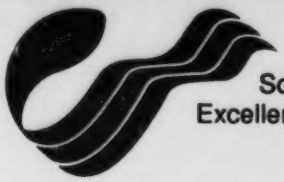

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An Evaluation of the Escapement and Survival of Selected Lower Fraser River Area Wild Coho Salmon Stocks

N.D. Schubert and J.O. Fleming

Department of Fisheries and Oceans
Fisheries Branch
80 - 6th Street
New Westminster, British Columbia V3L 5B3

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February 1989

AN EVALUATION OF THE ESCAPEMENT AND SURVIVAL OF SELECTED LOWER FRASER RIVER AREA WILD COHO SALMON STOCKS

by

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ABSTRACT

Schubert, N.D. and J.O. Fleming. 1989. An evaluation of the escapement and survival of selected lower Fraser River area wild coho salmon stocks. Can. MS Rep. Fish. Aquat. Sci. 2006: 121 p.

Coded wire tags (CWT) were applied to wild coho salmon (**Oncorhynchus kisutch**) stocks in the Vedder-Chilliwack, Salmon, upper Pitt and Campbell rivers and Salwein Creek to assess the harvest distribution, migratory pattern, survival and harvest rate of those stocks. Spawner enumeration studies were conducted in each system to estimate the escapement of coded wire tagged coho adults.

Vedder-Chilliwack system escapements were evaluated through a variety of primarily subjective techniques. Survival from smolt to adult escapement ranged from 4.6% to 5.6% over three Vedder-Chilliwack River brood years. Survival from fry to adult escapement ranged from 0.4% to 1.8% over four upper Chilliwack River brood years. Long term CWT loss ranged from 4.7% to 11.4%. Subjective estimation techniques may have limited study reliability.

Salmon River escapements were evaluated from spawner curve data. Survival from smolt to adult escapement ranged from 2.8% to 7.3% over three brood years. Long term CWT loss ranged from 7.3% to 11.3%. Inability to evaluate annual spawner residence time may have limited study reliability.

Upper Pitt River escapements were evaluated from a spawner index calibrated to a base period mark-recapture study. Survival from age 0+ fry to age three and four adult escapement averaged 0.5% and 0.6%, respectively, over two brood years. Survival from age 1+ fry to age four adult escapement averaged 1.8% over two brood years. Long term CWT loss ranged from 14.3% to 17.4%. Uncertainty associated with stream indexing may have limited study reliability in two of the three years.

Salwein Creek escapement was evaluated by a mark-recapture study. Survival from smolt to adult escapement was 4.3% for 1980 brood coho. Long term CWT loss was 3.3%. Study results were relatively unbiased.

Campbell River escapement was evaluated at a fence. Survival from smolt to adult escapement was 6.1% for 1980 brood coho. The escapement estimate may have a negative bias.

The report also documents straying and biosample results.

Key words: lower Fraser River area, coho salmon, coded wire tag, spawner escapement, survival, biosample.

RÉSUMÉ

Schubert, N.D.and J.O. Fleming. 1989. An evaluation of the escapement and survival of selected lower Fraser River area wild salmon coho stocks. Can. MS Rep. Fish. Aquat. Sci. 2006: 121 p.

Des saumons coho sauvages (**Oncorhynchus kisutch**) des rivières Vedder-Chilliwack, Salmon et Campbell, de la Pitt d'amont et de la crique Salwein ont été étiquetés de micromarques magnétisées codées. Cette opération avait pour but d'étudier la répartition des récoltes, les mouvements migratoires, ainsi que les pourcentages de survie et de récolte. Des chercheurs ont fait le dénombrement des géniteurs dans chaque cours d'eau en vue de déterminer les échappées de saumons coho adultes munis de micromarques magnétisées codées.

Les estimations du numbre de saumons revenants aux systémes Vedder-Chilliwack ont été évalués par un nombre de techniques subjectifs. La survie des saumoneaux argentés à adultes a rangé de 4.6% à 5.6% durant les trois anneés d'élevage du systéme Vedder-Chilliwack. La survie des saumoneaux argentés à adultes a rangé de 0.4% à 1.8% durant quatre anneés d'élevage dans le système haute Chilliwack. La perte des étiquettes de fils métalliques a rangé de 4.7% à 11.4%. Les techniques d'estimations subjectifs ont limités la confidence de l'étude.

Les échapments du rivière Salmon ont été évalués par l'interprétation de données par rapport à la remonte du saumon pour cette rivière. La survie des saumoneaux argentés à adultes a rangé de 2.8% à 7.3% pour trois années d'élevage. La perte des étiquettes de fils métalliques a rangé de 7.3% à 11.3%. L'inabilité d'évaluer le temps de résidence pour les saumons revenant aux aires de frai a limité la confidence de l'étude.

Les échapments de la section haute du rivière Pitt ont été évalués d'un index d'échapment, qui a été calibré par une étude de marguage récapture. La survie des 0+ poissons juveniles à adulte de trois ans et quatre ans a avarié de 0.5% à 0.6% respectivement pour les deux années d'élevage. La survie des 1+ poissons juveniles à adultes de quatre ans a avarié de 1.8% pour deux années d'élevage. La perte des étiquettes de fils métalliques a rangé de 14.3% à 17.4%. L'incertitude qui est associé avec des etudes emplôyant un index pour un ruisseau a limité la confidence de l'étude pour deux des trois années d'études.

L'échapment du ruisseau Salwein a été évalué par un étude de marquage récapture. La survie des saumoneaux argentés à adultes revenant aux aires de frai a été 4.3% pour l'année d'élevage de 1980. La perte des étiquettes de fils métalliques a été 3.3%. Les résultats de l'étude ont été rélativement impartial.

L'échapment de la riviére Campbell a été évalué avec une palissade. La survie des saumoneaux argentés à adultes a été 6.1% pour l'anneé d'élevage 1980. L'estimation de l'échapment peut avoir un penchant négatif.

Le rapport documente l'égaration et les résultats des échantillions biologiques.

Mots-clés: Secteur du bas Fraser, saumon coho, micromarques magnétisées codées, échappées de géniteurs, survie, prélèvements biologiques.

INTRODUCTION

Since the application of the coded wire tag (CWT) marking technique to Pacific Salmon (**Oncorhynchus sp.**) in the early 1970's, a number of studies have been conducted in British Columbia to evaluate the harvest distribution, migratory pattern, survival and harvest rate of wild coho salmon (**O. kisutch**) stocks (Argue and Armstrong 1977; Armstrong and Argue 1977). In the lower Fraser River area (Fig. 1), CWTs were applied to wild coho juveniles in the Vedder-Chilliwack River (Fedorenko and Cook 1982), Salmon River (Schubert 1982), Campbell River (Schubert 1983), Salwein Creek (Schubert 1984) and upper Pitt River (Schubert and Fedorenko 1985). These stocks were selected for study for a number of reasons, the most important being they comprised over 40% of the lower Fraser River area coho escapement during the early 1970's (Farwell **et al.** 1987). Their study, therefore, was considered important to the formulation of harvest management strategies for the Fraser River area coho resource.

Spawner enumeration programs were conducted in the five study areas between 1978 and 1983. The purpose of these programs was to estimate total coho adult escapement and escapement by CWT group for each year in which adipose fin clipped (AFC) coho adults returned to a study area. Enumeration techniques varied considerably, both between study areas and annually within study areas, due to physical and budgetary constraints. As a result, the accuracy and precision of escapement estimates varied.

This report treats the five study areas independently. For each area, the report describes the study background and documents field methodologies, escapement estimation techniques and study results, including age, length and sex composition, AFC incidence and estimates of coho adult escapement, long term CWT loss and adult escapement by CWT code. The studies did not estimate the escapement of precocious males (jacks). Each section concludes with a discussion of data limitations. An analysis of exploitation rate, survival and harvest distribution will be published in a future report.

VEDDER-CHILLIWACK RIVER

BACKGROUND

The Vedder-Chilliwack River, the largest of the four systems studied, arises in the Cascade Mountains of Washington State and flows in a westerly direction for 94 km entering the Sumas River and subsequently the Fraser River near Chilliwack (Fig. 2). The system was described in a previous report documenting the juvenile component of this study (Fedorenko and Cook 1982).

The juvenile capture and tagging study was conducted in two phases from 1976 to 1979. In the first phase, coho smolts were captured at fence traps located in up to seven small streams tributary to the Vedder-Chilliwack River in the springs of 1976 to 1978. An estimated 17,515, 20,679 and 31,567 coho smolts were released with CWTs (adjusted for long term CWT loss) in 1976, 1977 and 1978, respectively (Appendix 1a). In the second phase, juveniles originating primarily from the upper Chilliwack River were captured in minnow traps in Chilliwack Lake in the autumns of 1976 to 1979. An estimated 20,630, 4,934, 13,676 and 23,583 juveniles were released with CWTs in 1976, 1977, 1978 and 1979, respectively (Appendix 1b).

This report documents the escapement of AFC coho adults to the upper Chilliwack River, to release sites in streams tributary to the Vedder-Chilliwack River and to other spawning areas within the system.

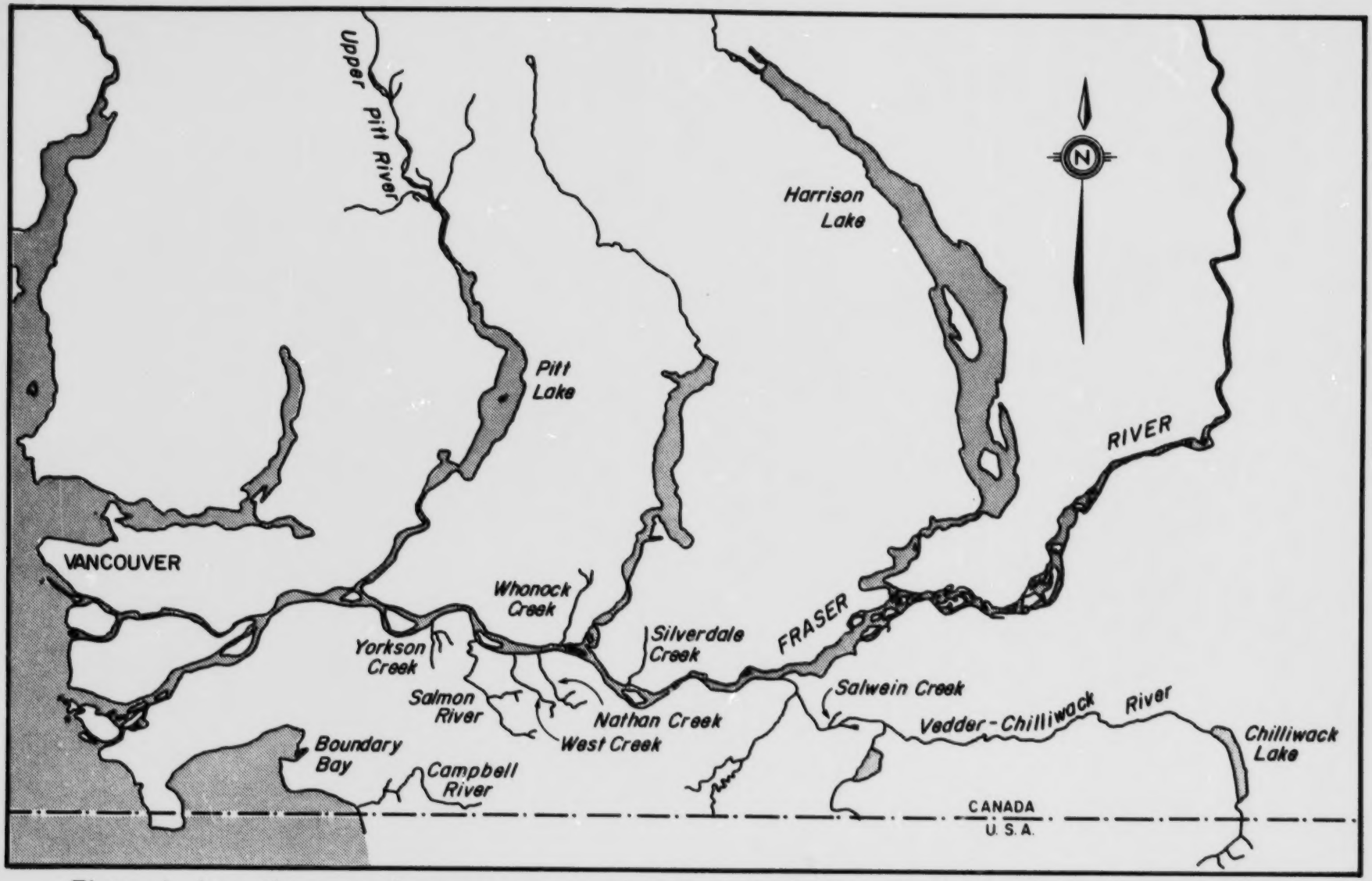

Figure 1 Location map of streams surveyed during coho CWT studies in the lower Fraser River area, 1976 to 1985.

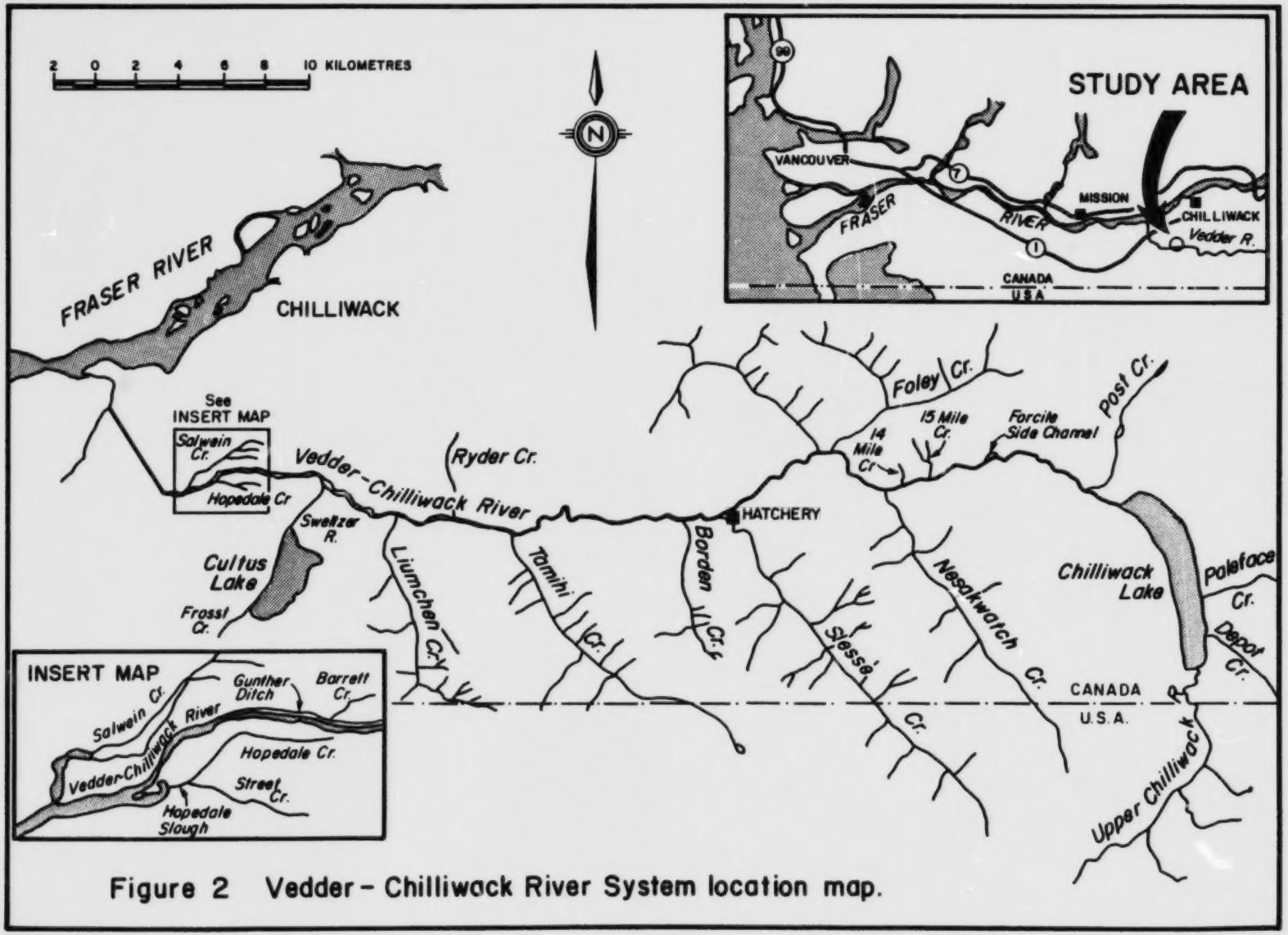

Figure 2 Vedder - Chilliwack River System location map.

METHODS

Mark-Recapture

Coho salmon were captured with beach seines in the Vedder-Chilliwack River mainstem in 1977-78 and at fence traps in three tributaries, Hopedale, Ryder and Salwein creeks, in 1978-79. Captured coho adults were Petersen disk tagged in a wooden tray (10 cm x 10 cm x 100 cm) constructed with a flexible plastic bottom and a meter stick recessed in one side. The tags consisted of two 2.2 cm diameter laminated cellulose acetate disks and one 0.7 cm diameter transparent plastic buffer disk threaded through centrally punched holes onto a 7.7 cm long nickel pin. The pin was inserted with pliers through the musculature and pterygiophore bones approximately 1.2 cm below the anterior portion of the dorsal fin insertion. The disk tags, arranged with one on each side of the fish and with a buffer disk on the pin head side, were secured by twisting the pin into a double knot. One tag per pair was numbered for individual identification. A secondary mark was not used during this study.

Size (postorbital-hypural plate (POH) length to the nearest 0.1 cm), sex, adipose status and general condition (hook marks, net marks) were recorded and scale samples were obtained from all captured coho. Census procedures are discussed later.

Violations of the basic assumptions underlying the single census mark-recapture technique occurred in study design and in execution in both 1977 and 1978. As a result, mark-recapture data were not used in escapement estimation.

Fence Traps

Hopedale Creek: In 1978-79, Hopedale Creek coho adults were enumerated at a trap located approximately 0.4 km from the mouth. The trap consisted of two fences aligned in an upstream 'V' pattern, with a 1.2 m x 2.4 m x 1.2 m box at the apex. The fences and box were constructed from 2.3 cm diameter 1.8 m long wooden broom sticks inserted through holes drilled at 3.8 cm intervals in two 5.1 cm x 10.2 cm wood stringers which were secured to the substrate with steel bars designed for concrete reinforcement (rebar).

The trap was monitored from November 6, 1978 to February 22, 1979 (Appendix 2). The trap overflowed due to high water early in the study; however, since coho had not yet arrived in the stream, the escapement estimate was not affected.

The trap was inspected once per day. All fish were removed from the trap box with a dip net, enumerated by species and released above the trap. Coho were recorded as female, adult male or jack and AFCs were noted. Coho adults released with disk tags were sampled, as described earlier.

Ryder Creek: In 1978-79, Ryder Creek coho adults were enumerated at a trap of similar design located approximately 0.5 km from the mouth. The trap was monitored, as described above, from November 6, 1978 to February 22, 1979 (Appendix 3). The trap overflowed to due high water on November 7 and February 10-14. Since coho adults were migrating into the stream during the latter period, reported catch may underestimate actual escapement.

Salwein Creek: Salwein Creek coho adults were enumerated at a trap located 0.8 km from the mouth from 1977-78 to 1979-80. The trap was installed at a set of concrete abutments and sill located at the outflow of a pond excavated in the creek by the Department of National Defence. The trap consisted of two 5.2 m long fences installed perpendicular to the creek flow, enclosing a 3.9 m section

of concrete-lined channel. Each fence consisted of 1.3 m x 1.25 cm square aluminum tubing inserted through holes punched at 1 cm intervals in two 10.5 cm aluminum I-beam stringers which were secured to the concrete abutments with bolts. The two fences were joined by a fence of similar construction, creating a 3.9 m x 3.7 m trap and a 3.9 m x 1.5 m holding box. Fish entered the trap through a 0.3 m x 0.6 m hole in the downstream sill.

In 1977-78, the trap was monitored, as described above, from December 1, 1977 to February 15, 1978 (Appendix 4a). The trap overflowed January 1 to 5 due to ice formation; however, coho were unlikely to have passed during that period. In 1978-79, the trap was monitored from October 16, 1978 to February 23, 1979 (Appendix 4b). Although the trap overflowed from November 20 to 24 and from December 28 to January 10 due to ice formation, coho were unlikely to have escaped enumeration. In 1979-80, the trap was monitored from November 20, 1979 to January 16, 1980 (Appendix 4c). The trap overflowed on December 5 due to milfoil buildup and from December 16 to January 2 and January 5 to 14 due to ice formation. Significant numbers of coho may have escaped enumeration during the latter periods.

Upper Chilliwack River: Upper Chilliwack River coho adults were enumerated at a trap located approximately 0.2 km from the mouth from 1978 to 1981. The trap consisted of a 50 m long fence installed perpendicular to the stream flow, with a trap box located near the mid point. The fence was constructed from 2.3 cm diameter, 1.8 m long wooden broom sticks inserted through holes drilled at 3.8 cm intervals in two 5.1 cm x 10.2 cm wood stringers. The fence was angled at twenty degrees from the vertical, with the ends of each stringer supported by a wood tripod which was secured to the substrate with sand bags and steel rebar. The substrate under the fence was lined with 6 mm plastic sheeting and plastic coated chain link fencing, and the upstream side was lined with sandbags.

The trap was monitored in four years: from October 5 to 23, 1978 (Appendix 5a); from September 1 to October 25, 1979 (Appendix 5b); from September 12 to November 1, 1980 (Appendix 5c); and from September 19 to October 27, 1981 (Appendix 5d). Each year, coho migration was limited until high flows caused by heavy rainfall destroyed the fence. Reported catch, therefore, may underestimate escapement by a significant but unknown magnitude.

The trap was monitored, as described above, and all captured coho were measured (nose-fork (NF) length to the nearest 0.1 cm) and scale sampled; however, because coho avoided the trap, a portion of the migration was enumerated through a hole in the fence created by removing one or two broom sticks. Because observation time was limited, the reliability of sex and AFC identification was reduced.

Stream Surveys

Foot surveys were conducted in the Vedder-Chilliwack mainstem and tributaries and in the upper Chilliwack River in three years: from November 18, 1977 to February 13, 1978 (Appendix 6); from October 23, 1978 to February 22, 1979 (Appendix 7); and from November 14, 1979 to February 8, 1980 (Appendix 8). Survey effort varied from spot checks to complete surveys of all known spawning areas. In the upper Chilliwack River, surveys were limited to the 2.5 km of stream below the Canada-United States Border. Survey frequency varied considerably between areas each year, with CWT release sites and major spawning streams receiving the greatest effort. An exception was the Vedder-Chilliwack River mainstem, which was not surveyed in 1979-80.

On each survey, live coho adults were enumerated visually and all coho carcasses were sampled, cut in two with a machete to avoid counting the same fish on subsequent surveys, and returned to the stream. Size (POH length to the nearest 0.1 cm), sex, adipose condition data and scale samples were obtained from all carcasses and, for AFC coho, the head was removed for later CWT recovery and decoding.

Escapement Estimation

Escapement was estimated only in spawning areas where AFC coho adults were recovered. In many cases, estimation reliability was unknown and probably limited because survey procedures were generally unrelated to the data requirements of any particular estimation method. As a result, the estimation method used in each area was determined after an assessment of the suitability and quality of existing data. Escapement estimation methods are described in descending order of priority below.

Fence Counts: Fence counts provided a reliable escapement estimate when the trap operated without interruption through the entire return period or, when interruptions occurred, if coho movements were minor. Fence counts were used as escapement estimates in Hopedale Creek in 1978-79 and in Salwein Creek in 1977-78 and 1978-79.

Spawner Curves: When complete fence counts were unavailable, escapement was estimated from stream survey data. Tributary live counts were plotted by date to calculate an area under the curve (AUC) in spawner-days (Appendix 9). The spawner-day estimate provided an index of spawner abundance which was converted to an escapement from an estimate of spawner residence time. Estimates of spawner residence time, normally the mean difference between cumulative percent live and dead counts, were not reliable in many areas due to variable survey coverage and frequency. Instead, the relationship between spawner-days and fence counts in Hopedale Creek in 1978-79 and in Salwein Creek in 1977-78 and 1978-79 (one spawner equals 4.16 spawner-days) (Appendix 9) was applied to indices from other tributary spawning areas. This technique was appropriate only in areas where all observed adults were in the process of spawning. Those areas where live counts included coho which were holding as well as spawning (as indicated by peak live and dead counts greater than 14 days apart) were excluded from this analysis.

Recovery Rate: In tributaries where the time between observed peak live and dead counts was greater than 14 days (Appendix 9), escapement was calculated from carcass recovery levels. A mean carcass recovery rate of 35.5%, determined from the 1978-79 Salwein Creek and Hopedale Creek mark-recapture data, was applied to appropriate tributary carcass counts. Ryder Creek recovery rates were excluded because stream surveys were terminated shortly after the peak disk tag release. The Vedder-Chilliwack and upper Chilliwack rivers were excluded from this analysis because of differential mainstem and tributary carcass recovery rates.

Subjective Estimates: Vedder-Chilliwack and upper Chilliwack river data were inadequate for any of the previously described techniques. Escapement estimates were provided by field staff, based on a subjective evaluation of the available empirical data, and may be of limited reliability.

Adipose Fin Clip Incidence

The escapement of AFC coho adults to each spawning area was the product of the AFC incidence from a sample and the escapement estimate. In most

cases, the AFC incidence was estimated from the spawning ground recovery sample; however, there were exceptions. First, the AFC incidence from fence counts was used when available because sample size was generally larger (complete in some cases), sampling was not subject to biases which potentially influence spawning ground samples, and the physical condition of the fish minimized AFC recognition error. Fence counts were used in Salwein Creek in 1977-78, 1978-79 and 1979-80, in Ryder and Hopedale creeks in 1978-79, and in the upper Chilliwack River in 1978, 1979, 1980 and 1981. Second, when spawning ground or fence samples were unavailable (Vedder-Chilliwack River mainstem in 1979-80), the average AFC incidence observed in that area in other years was used.

Escapement by CWT Code

The escapement by CWT code and long term CWT loss were estimated by applying the CWT composition of the spawning ground sample to the estimated escapement of AFC coho adults. In most cases, CWT composition data specific to each tributary were used; however, in some cases, tributary sample data were inadequate or unavailable. The annual average was used to calculate the return by CWT code in Borden and Post creeks and in the Vedder-Chilliwack River in 1977-78, Borden Creek, Hopedale Slough and the Vedder-Chilliwack River in 1978-79, and Fourteen Mile Creek and the Vedder-Chilliwack River in 1979-80. In the upper Chilliwack River, the CWT composition observed in 1979 was applied to the 1978 data, and the average CWT loss was applied in 1978, 1980 and 1981.

RESULTS

Estimation of Spawner Population

The estimated adult escapement to spawning areas where AFC coho were observed is detailed in Appendix 9. Escapement by CWT code is detailed in Appendix 10 and is summarized in Table 1.

AFC coho adults from the Vedder-Chilliwack River smolt releases returned to up to 13 Vedder-Chilliwack River spawning areas and to the upper Chilliwack River. The AFC adult escapement from these releases was estimated at 1,086 in 1977-78, 1,140 in 1978-79 and 1,575 in 1979-80.

AFC coho adults from the upper Chilliwack River fry releases returned only to the upper Chilliwack River. The AFC adult escapement from those releases was estimated at 155 in 1978, 95 in 1979, 71 in 1980 and 108 in 1981.

CWT Loss

Long term CWT loss in the Vedder-Chilliwack smolt release groups, calculated from spawning ground recovery data, averaged 11.4%, 4.7% and 7.8% in the 1977-78, 1978-79 and 1979-80 returns, respectively (Table 1). Long term CWT loss in the upper Chilliwack River fry release groups was 15.4% and 37.5% in the 1979 and 1980 returns respectively (Table 1); however, both estimates were based on small samples and were considered unreliable.

The effects of carcass decomposition and predator activity on measured CWT loss could not be estimated because carcass and eye condition data were not collected (see Salmon River).

Survival

Before calculating the survival from juvenile release to spawning ground escapement, the release data were adjusted to reflect long term CWT loss, as measured by the spawning ground sample (Table 1). This was done to ensure consistency with harvest estimates. The estimated survival from smolt release to adult

Table 1. Summary of juvenile releases, adult escapements and survivals to adult escapement of coded wire tagged Vedder-Chilliwack River system coho salmon.

Recovery year	Release year	Dominant brood year	CWT code[a]	Number released[b]	Spawning ground recoveries		Estimated adipose clipped escapement	Survival (%)
					Number	%		
Vedder-Chilliwack smolt releases								
1977-78	1976	1974	02 15 13	17,515	195	88.6	982	5.6
			no tag	-	25	11.4	104	-
1978-79	1977	1975	02 04 13	20,679	162	95.3	1,093	5.3
			no tag	-	8	4.7	47	-
1979-80	1978	1976	02 21 24	31,567	306	92.2	1,456	4.6
			no tag	-	26	7.8	119	-
Upper Chilliwack River fry releases								
1978	1976	1975	02 15 11	20,630	0	-	143 [c]	0.7
			no tag	-	0	-	12 [d]	-
1979	1977	1976	02 21 20	4,934	7	46.2	87	1.8
			no tag	-	2	15.4	8 [d]	-
1980	1978	1977	02 21 30	13,676	5	62.5	65 [c]	0.5
			no tag	-	3	37.5	6 [d]	-
1981	1979	1978	02 17 60	23,583	0	-	99 [e]	0.4
			no tag	-	0	-	9 [d]	-

a CWTs lost during dissection were allocated in proportion to codes observed in the spawning ground sample for that location.
b Adjusted for long term CWT loss.
c Estimated from proportion by code observed in 1979.
d CWT loss estimated from 1977-79 Vedder-Chilliwack average (8.0%).
e Dissection data from ten recovered heads were lost. It was assumed that all adults which returned with CWTs were from the 1979 release.

escapement (excluding all harvest and jack escapement) averaged 5.2% over the three year study, with annual estimates of 5.6%, 5.3% and 4.6% in 1977-78, 1978-79 and 1979-80, respectively. The estimated survival from fry release to adult escapement averaged 0.9%, with annual estimates of 0.7%, 1.8%, 0.5% and 0.4% in 1978, 1979, 1980 and 1981, respectively (Table 1).

Straying

Straying was defined as the documented recovery of an AFC adult in a Vedder-Chilliwack River system spawn-

ing area other than a CWT release site. Adult returns from the Vedder-Chilliwack smolt releases strayed at rates of 33.9%, 31.7% and 25.5% in 1977-78, 1978-79 and 1979-80, respectively (Table 2). Returning adults strayed throughout the system, including to the upper Chilliwack River. Straying was not observed in adult returns from the upper Chilliwack River fry releases.

Age/Length/Sex Composition

The age composition of Vedder-Chilliwack River and upper Chilliwack River coho salmon is detailed in Appendix 11 and summarized in Table 3. Vedder-Chilliwack River coho adults returned at age 4_3 and 3_2, with the former averaging 4.1% (range 3.2% to 5.3%) of the spawning ground sample. Jacks averaged 0.4% (range 0.2% to 0.7%) of the sample; however, size selective sampling biases likely resulted in an underestimate of the proportion of jacks in the escapement. Upper Chilliwack River coho adults also returned at age 4_3 and 3_2; however, the proportion returning at age 4_3 was considerably higher, averaging 8.0% (range 3.2% to 11.6%) of the sample. Jacks averaged 0.4% of the sample, also an underestimate because the fence was not designed to trap jacks. In 1978-79 and 1979-80, the only years of data for both the Vedder-Chilliwack and upper Chilliwack rivers, there was no difference between streams in adult age composition ($p > 0.05$; difference in proportions test, Dixon and Massey 1969).

Mean POH lengths of Vedder-Chilliwack River spawning ground samples are detailed by year, sex and age in Appendix 11a; mean NF lengths of upper Chilliwack River coho sampled live at the trap are detailed, as above, in Appendix 11b. Adult males and females in the Vedder-Chilliwack River averaged 46.4 cm (57.8 cm) and 46.7 cm (58.5 cm) POH (NF) length (NF estimated from regression; Appendix 11a), respectively. Adult males and females in the upper Chilliwack River averaged 62.0 cm and 61.4 cm NF length, respectively. No differences were noted ($p > 0.05$; t-test) in mean length by age or sex within or between years.

Females comprised 57.4%, 57.8% and 58.0% of the adults in the Vedder-Chilliwack River spawning ground samples in 1977-78, 1978-79 and 1979-80, respectively; however, due to possible sex related biases associated with spawning ground surveys, these data may not reliably estimate the sex composition of the escapement. The proportion of females observed at traps in Hopedale, Ryder and Salwein creeks was somewhat lower than the above (Appendices 2 to 4).

Upper Chilliwack River females comprised 41.9%, 52.4% and 72.6% of the adult spawning ground sample in 1978-79, 1979-80 and 1980-81, respectively (Appendix 11b). In comparison, females comprised 49.6%, 50.9% and 59.5% of the adult fence count in each respective year (Appendix 5).

DISCUSSION

Escapement Estimation Error

Error in the estimation of escapement by CWT code may have arisen from error in the estimation of total escapement, AFC incidence or CWT loss. Assessment of the magnitude and direction of this error was complicated by the often ad hoc methodologies used to generate escapement estimates and by the range of AFC incidences in spawning areas to which AFC coho returned. For example, the application of Salwein Creek and Hopedale Creek spawner curve and recovery rate data to other tributaries assumed that sighting conditions, fish behavior and survey design were comparable between areas. While this assumption may have been valid in some estimates, it may have introduced error in others. A potentially more serious problem was

Table 2. Observed straying of coded wire tagged coho adults in the Vedder-Chilliwack River system.

Release group	Return year	Estimated return to release sites	Estimated return to other areas: Total Number	Total %	Tributaries only Number	Tributaries only %
Vedder-Chilliwack smolts	1977-78	718	368	33.9	177	16.3
	1978-79	779	361	31.7	75	6.6
	1979-80	1,173	402	25.5	27	1.7
Upper Chilliwack River fry	1978-79	155	0	0.0	0	0.0
	1979-80	95	0	0.0	0	0.0
	1980-81	71	0	0.0	0	0.0
	1981-82	108	0	0.0	0	0.0

Table 3. Age composition of Vedder-Chilliwack River and upper Chilliwack River coho salmon.

Location	Year	Sample size	% by age: 4_3	3_2	3_3	2_2
Vedder-Chilliwack River [a]	1977-78	402	3.2	96.5	0.0	0.2
	1978-79	516	3.9	95.7	0.0	0.4
	1979-80	568	5.3	94.0	0.0	0.7
	Average	-	4.1	95.4	0.0	0.4
Upper Chilliwack River [b]	1978-79	87	9.2	89.7	1.1	0.0
	1979-80	126	3.2	96.8	0.0	0.0
	1980-81	95	11.6	88.5	0.0	0.0
	Average	-	8.0	91.7	0.4	0.0

a Spawning ground carcass samples.
b Live sampled at trap.

the subjective escapement estimation procedures and the often inadequate samples used to estimate both AFC incidence and long term CWT loss in the Vedder-Chilliwack and upper Chilliwack rivers, two of the largest individual CWT return areas (Appendix 10). Error would differentially

impact the evaluation of the upper Chilliwack River CWT groups because those groups returned only to the upper Chilliwack River. While the impact of error on the Vedder-Chilliwack data would be less, an average 22% (Appendix 10) of the estimated escapement of those CWT groups was to the upper Chilliwack or Vedder-Chilliwack rivers. Although the data were inadequate to permit an objective evaluation, the impact of this potential error on the overall CWT escapement estimate may have been significant.

Straying

The observed incidence of straying of wild Vedder-Chilliwack coho salmon was considerably greater than that reported in the literature. For example, other studies provide estimates of 14.9% in Waddell Creek (Taft and Shapovalov 1938) and 1.3% in the Cowichan/Koksilah River (Lister **et al.** 1981). Two factors are likely responsible for the high observed incidence of straying. First, a large percentage of the strays were recovered in the Vedder-Chilliwack and upper Chilliwack rivers. The Vedder-Chilliwack River escapement and, therefore, escapement of CWTs may have been overestimated because visual counts in that area may have included adults holding in mainstem pools prior to moving into tributaries. The upper Chilliwack River CWT escapement, based on subjective estimates of total escapement and small CWT samples, were considered unreliable. Estimated straying would be considerably reduced if returns to these areas were excluded (Table 2). Second, observed straying may reflect intrasystem juvenile migrations rather than true straying by adults. The juvenile component of this study documented the recapture of upper Chilliwack River juveniles in Vedder-Chilliwack River tributaries the following spring (Fedorenko and Cook 1982). Since upper Chilliwack River CWTs were not recovered in Vedder-Chilliwack tributaries, these observations suggest that, at least for upper Chilliwack River coho, straying of returning adults may be minor relative to intrasystem migration by rearing juveniles.

SALMON RIVER

BACKGROUND

The Salmon River is a small lowland stream which flows in a northwesterly direction for approximately 33 km, entering the Fraser River near Fort Langley (Fig. 3). The system was described in a previous report documenting the juvenile component of this study (Schubert 1982).

The juvenile capture and tagging study was conducted in the springs of 1978 to 1980. Coho smolts were captured at traps in the Salmon River and Coghlan Creek, the principal tributary (Fig. 3). An estimated 12,103, 29,082 and 28,423 coho smolts were released with CWTs in 1978, 1979 and 1980, respectively (adjusted for long term CWT loss). This report documents the total adult escapement and the escapement of AFC coho adults to the Salmon River system in 1979-80, 1980-81 and 1981-82.

METHODS

Stream Surveys

Salmon River System: Foot surveys were conducted in three years: November 6, 1979 to February 8, 1980 (Appendix 12a); November 12, 1980 to January 21, 1981 (Appendix 12b); and November 3, 1981 to February 3, 1982 (Appendix 12c). Although weekly surveys were planned, schedule delays resulting from freshets or the lack of staff were frequent.

On each survey, a two-person crew equipped with sunglasses with polarizing filters covered all known spawning areas. Live adults were enumerated

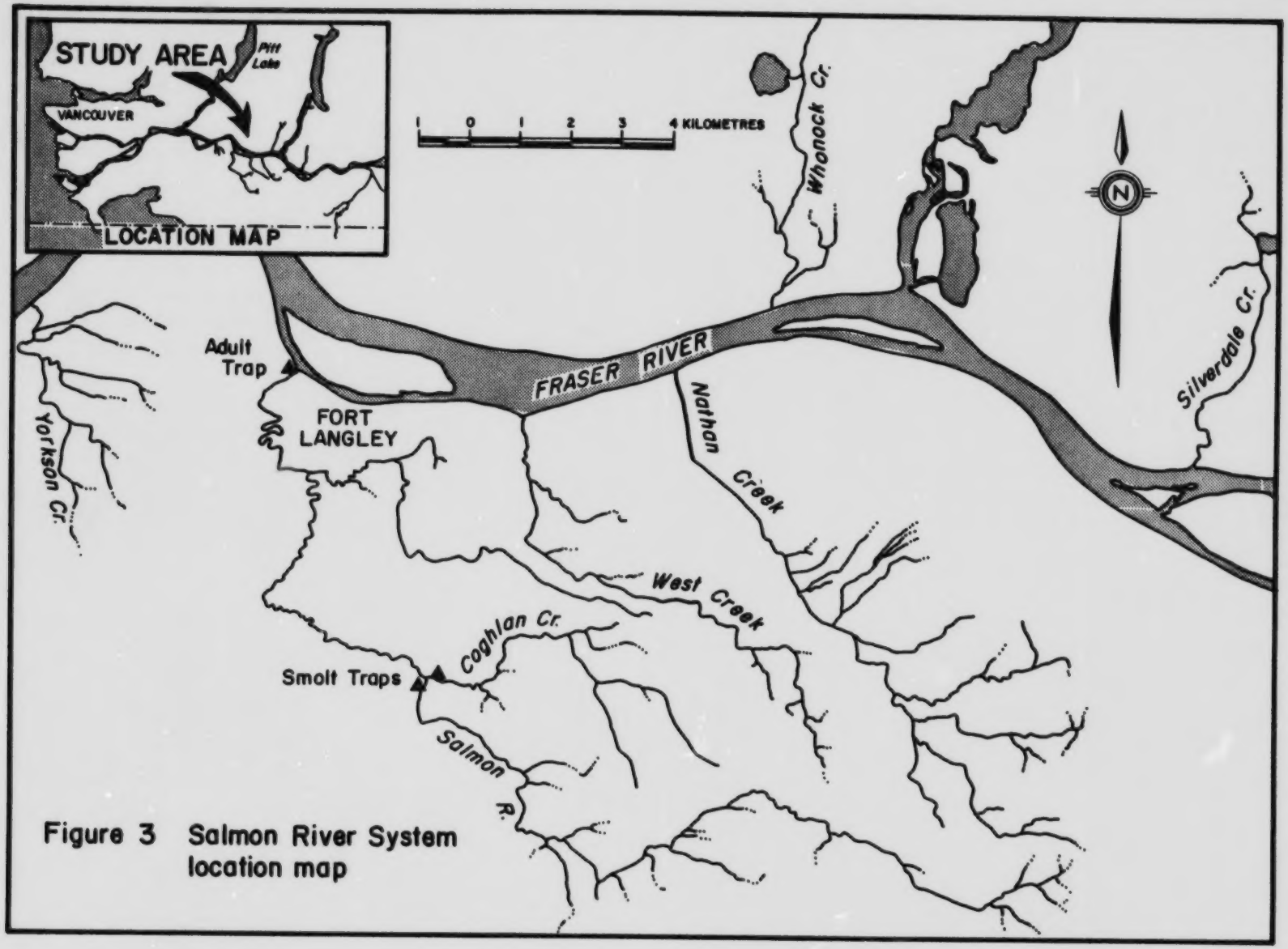

Figure 3 Salmon River System location map

visually and all carcasses were sampled, cut in two with a machete to avoid recounting on subsequent surveys and returned to the stream. Sample data, recorded by date and recovery location, included size (POH length to the nearest 0.1 cm), sex (confirmed by abdomen incision), adipose and carcass condition and scale samples and, for AFC coho, the head was removed posterior to the eye orbit for later CWT indentification. Adipose fin condition was recorded as unclipped or as complete (flush with dorsal surface), partial (nub present) or questionable (appeared clipped but fungus or decomposition obscured area). The condition of AFC carcasses was recorded as fresh (gills red or mottled), moderately fresh (gills white, body firm), moderately rotten (body intact, flesh soft) or rotten (skin and bones), and the absence of one or both eyes was noted.

Other Streams: In 1980, five nearby streams (Nathan, Silverdale, West, Whonock and Yorkson creeks) (Fig. 3) were surveyed three times, as above, to determine the incidence of AFC Salmon River coho in those streams (Appendix 12d). Only AFC carcasses were sampled.

Fence Trap

A trap, described by Slaney and Milko (MS 1982), was operated at the Salmon River mouth from October 2 to December 16, 1981 (Appendix 13). Trap efficiency was reduced during high flows on October 27, October 29, November 1-2 and December 2-4. Since adult coho were known to be actively migrating in late October and early November, reported catch may substantially underestimate actual returns.

The daily catch was enumerated by species, sampled and released above the trap. Coho salmon were recorded as female, adult male or jack and AFCs were noted. A daily sample of 10% of the catch was measured (POH and NF lengths to the nearest 0.1 cm) and scale sampled.

Escapement Estimation

Escapement was estimated using the spawner curve technique described by McNeil (1964) and discussed previously. Stream survey live counts were plotted by date in order to calculate the area under an eye-fitted curve (spawner-days). Average spawning ground residence time, used to convert spawner-days to an escapement, could not be estimated from study data due to variable survey frequency. Instead, the average residence time observed in Vedder-Chilliwack tributaries in 1977-78 and 1978-79 (4.2 days) was used to convert spawner-days to escapement.

Adipose Fin Clip Incidence

The 1979-80 and 1980-81 escapement of AFC coho adults was the product of the AFC incidence in the spawning ground sample and the escapement estimate. Estimates for Coghlan Creek and Salmon River were summed to provide a total escapement of AFC coho adults. The 1981-82 escapement of AFC coho adults was estimated in a similar way; however, because of a considerably larger sample, AFC incidence was estimated from the fence sample (Appendix 13).

Escapement By CWT Code

Before calculating the escapement by CWT code, CWT loss resulting from carcass decomposition or scavenging was evaluated by comparing the CWT incidence in each carcass condition and eye presence/absence group using a chi-squared test with correction for continuity (Sokal and Rohlf 1981). If a signficant difference was noted, the CWT incidence in the appropriate group ("eyes present" or the "fresh/moderately fresh" aggregate) was used. Escapement by CWT code and long term CWT loss was then calculated by apply-

ing the appropriate CWT composition of the spawning ground sample to the estimated escapement of AFC coho adults. In 1980-81, Coghlan Creek and Salmon River estimates were summed to estimate escapement by CWT code. The 1979-80 and 1981-82 escapement by CWT code was the product of the CWT composition in the pooled spawning ground recovery sample and the AFC escapement estimate because the 1979-80 Salmon River sample was small and the 1981-82 AFC incidence was calculated from the pooled fence sample.

RESULTS

Estimation of Spawner Population

The estimated escapement of coho adults and AFC coho adults to Coghlan Creek and Salmon River are detailed in Appendix 14. Escapement by CWT code is detailed in Appendix 15 and summarized in Table 4.

In 1979-80, an estimated 991 AFC coho adults returned in a total adult escapement of 10,266. In 1980-81, an estimated 2,124 AFC coho adults returned in a total adult escapement of 7,749. In 1981-82, an estimated 857 AFC coho adults returned in a total adult escapement of 2,818.

CWT Loss

Long term CWT loss was estimated at 11.3%, 9.7% and 7.3% in 1979-80, 1980-81 and 1981-82, respectively (Table 4). Predation, as indicated by the absence of eyes, did not significantly influence CWT loss in any year ($p > 0.05$; chi-square), while carcass decomposition influenced CWT loss only in 1980-81. In that year, CWT loss was estimated at 7.5%, 13.6%, 25.4% and 33.3% in the fresh, moderately fresh, moderately rotten and rotten groups, respectively (Appendix 16). The difference in CWT loss between the combined fresh (8.8%) and rotten (21.1%) groups was significant ($p < 0.05$); therefore, the fresh group was accepted as the best estimator of long term CWT loss. Carcass decomposition did not influence CWT loss in 1979-80 because carcasses were uni-

Table 4. Summary of smolt releases, adult escapements and survivals to adult escapement of coded wire tagged Salmon River system coho salmon.

Recovery year	Release year	Dominant brood year	CWT code	Number released[a]	Spawning ground recoveries		Estimated adipose clipped escapement	Survival (%)
					Number	%		
1979-80	1978	1976	02 16 52	12,103	47	88.7	879	7.3
			No tag	-	6	11.3	112	-
1980-81	1979	1977	02 16 59	29,082	112	90.3[b]	1,918	6.6
			No tag	-	26	9.7[b]	206	-
1981-82	1980	1978	02 18 23	28,423	38	92.7	794	2.8
			No tag	-	3	7.3	63	-

a Adjusted for long term CWT loss.
b CWT loss corrected for carcass decomposition bias (see text).

formly fresh or in 1981-82 because the sample was inadequate to assess carcass condition bias.

Survival

Estimated survival from smolt release (adjusted for long term CWT loss) to adult escapement (excluding all harvest, strays and jack escapement) averaged 5.6%, with annual estimates of 7.3%, 6.6% and 2.8% in 1979-80, 1980-81 and 1981-82, respectively (Table 4).

Straying

Straying, defined as the documented recovery of CWT marked Salmon River coho in other areas, was estimated at 15 adults (Appendix 12d), a stray rate of 0.8%.

Age/Length/Sex Composition

The age composition of Salmon River coho salmon is detailed in Appendix 17 and summarized in Table 5. Spawning ground samples averaged 14.8% (range 0% to 26.9%) age 4_3, 81.7% (range 69.2% to 97.7%) age 3_2, 1.8% (range 0% to 3.9%) age 2_2 and 1.7% (range 0% to 2.9%) age 3_3. In 1981-82, age samples were also available from the fence. The age composition of the fence and spawning ground samples was significantly different ($p < 0.05$; difference in proportions test), both in the proportion of jacks (30.9% and 3.9%, respectively) and in the age composition of the adult return (53.3% and 28.0% age 4_3, respectively). The low jack incidence in the spawning ground sample suggested a size related sampling bias. The reason for the difference in the adult age composition is unknown.

Mean POH and NF lengths of Salmon River coho salmon are detailed by year, sex and age in Appendix 17. POH length of adult males and females averaged 41.7 cm and 45.8 cm, respectively. No differences ($p > 0.05$; t-test) were noted within or between years in mean length by age or sex or between AFC recoveries of the same age and sex; however, the 1981-82 sample was inadequate to provide a reliable comparison.

Females comprised 43.9%, 45.4% and 52.0% of the adults in the spawning ground sample in 1979-80, 1980-81 and 1981-82, respectively. No significant difference was noted in the adult sex ratio in the 1981-82 fence and spawning ground samples (Appendix 17) ($p > 0.05$; difference in proportions test); however, the proportion

Table 5. Age composition of Salmon River coho salmon.

Year	Sample type	Sample size	% by age			
			4_3	3_2	2_2	3_3
1979-80	Spawning ground	177	0.0	97.7	0.0	2.3
1980-81	Spawning ground	138	17.4	78.3	1.4	2.9
1981-82	Spawning ground	26	26.9	69.2	3.9	0.0
Average	Spawning ground	-	14.8	81.7	1.8	1.7
1981-82	Trap	152	36.8	32.2	4.6	26.3

of females enumerated at the fence (40.8%) (Appendix 13) was significantly lower ($p < 0.05$; difference in proportions test) than in the spawning ground sample.

DISCUSSION

Escapement Estimation Error

Error in the Salmon River coho adult escapement estimates could result from two factors. First, spawner-curves based on visual counts have a negative bias due to fish behavior, sighting conditions and, in some cases, observer experience. Attempts were made to limit underestimation by using experienced staff, limiting staff turn-over and by ensuring staff worked within the stream and made efforts to dislodge coho from hiding places; however, due to the turbidity of the Salmon River, spawners were generally visible only when on riffles. Recorded live counts, therefore, may underestimated actual spawner abundance. We attempted to compensate for this bias by using spawner residence times estimated under similar conditions in two tributaries of the Vedder-Chilliwack River; however, unquantifiable intersystem differences in vulnerability to observation may have biased the estimate of Salmon River coho escapement. Second, the use of a single estimate of spawner residence time for all study years may have introduced error because residence time may change from year to year. Van den Berghe and Gross (1986) reported that body size (both average size and skewness of the distribution), spawner density and sex ratio had a significant influence on spawner residence time. They concluded that the use of an average life-span to estimate spawner numbers may give biased results. The impact of such factors on the true stream life in this study is unclear. Both body size and sex ratio were similar in all years of the study; however, apparent spawner density varied over a wide range. Although it is difficult to assess overall bias, a change in spawner density may have produced progressive overestimates of escapement over the three year study. In view of the above, both the accuracy and precision of the Salmon River coho escapement estimates may be poor.

Survival

Smolt to adult survivals in the Salmon River were influenced by a pump which operated at the Salmon River mouth during the spring freshet. Russell (MS 1981) estimated Salmon River coho smolt mortality rates of 26% and 31% in 1979 and 1980, respectively. Unfortunately, the pump was automated and, due to variable annual freshet timing, operated for different periods each year. It is not possible, therefore, to estimate the proportion of the AFC smolts which passed through the pump in any year. This differential impact on survival may contribute to the variable survivals estimated for this stock.

Straying

The estimated stray rate of 0.8% was considerably lower than levels estimated in other studies (see Vedder-Chilliwack discussion), possibly reflecting inaccuracies in the escapement estimates for the five survey streams. Escapements were based on minimal visual observations and are probably underestimates. The stray rate, therefore, was a minimum estimate.

UPPER PITT RIVER

BACKGROUND

The upper Pitt River flows in a southerly direction for approximately 52 km, entering the north end of Pitt Lake (Fig. 4). The system was described in a previous report documenting the juvenile component of this study (Schubert and Fedorenko 1985).

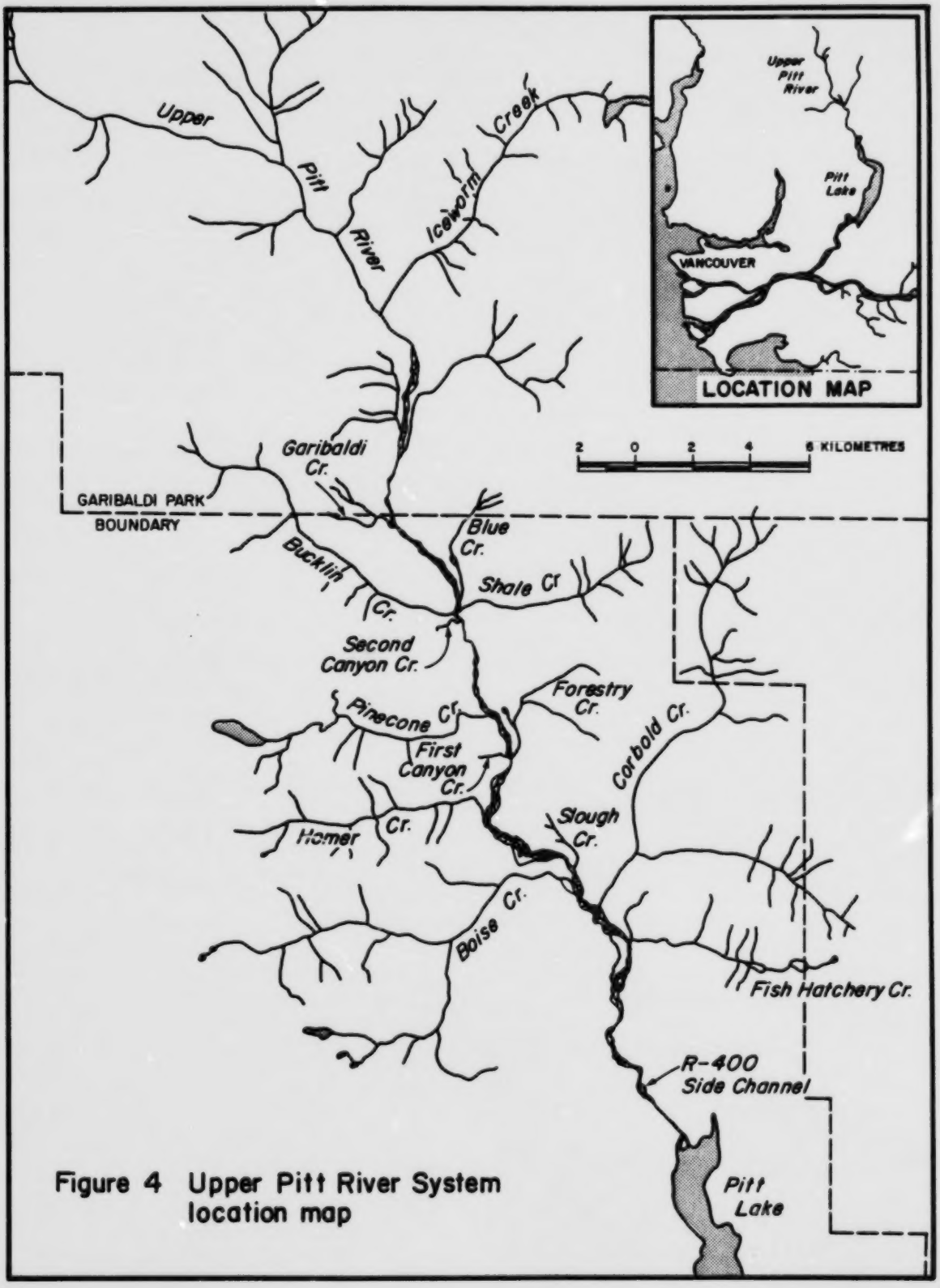

Figure 4 Upper Pitt River System location map

The juvenile capture and tagging study was conducted in the autumns of 1979 and 1980. Rearing juveniles were captured in minnow traps in up to ten major rearing areas. An estimated 51,841 age 0+ and 15,938 age 1+ juveniles were released with CWTs in 1979, while an estimated 60,592 age 0+ and 13,428 age 1+ juveniles were released with CWTs in 1980 (adjusted for long term CWT loss). This report documents the total adult escapement and the escapement of AFC coho adults to the upper Pitt River system in 1981-82, 1982-83 and 1983-84.

METHODS

Mark-Recapture

Coho salmon were captured for disk tagging from November 13 to 23, 1982. The fish were captured in mainstem pools using three 8.9 cm mesh beach seines (15.2 m x 4.6 m) joined to form a single 45.6 m long net. The net was set from an inflatable boat in areas known to contain fish and to be sufficiently free of debris to permit seining. Attempts were made to distribute capture effort in relation to coho abundance; however, lack of road access did not permit fish capture above the Garibaldi Park boundary (Fig. 4). Captured coho were retained in the net prior to tagging and release.

Coho were tagged using the Petersen disk tagging system. Both adults and jacks were tagged; however, jacks were excluded from the analysis. A secondary mark was not used during this study. Instead, disk tag loss was estimated from a similar study conducted in the Birkenhead River in 1984 (Schubert **et al.** 1985).

Date and location of tagging, disk tag number, NF length (± 0.1 cm in 1982; ± 0.5 cm in 1983), sex and adipose fin status were recorded for each fish released with a disk tag. The condition of the fish at release was recorded either as good (swam away without assistance) or poor (required ventilation), and any wounds were noted.

Stream Surveys

Stream surveys were conducted in three years: December 3, 1981 to January 16, 1982 (Appendix 18a); November 9, 1982 to January 28, 1983 (Appendix 18b); and November 25, 1983 to February 16, 1984 (Appendix 18c). Surveys were conducted biweekly, with each survey requiring two to eight days, depending upon the stage of spawning. On each survey, all major spawning areas were covered at least once, with minor spawning areas visited on an opportunistic basis. The only major exception occurred in 1983-84 when a bridge wash-out eliminated access to the upper spawning areas during the peak spawning period.

Daily survey procedures were identical to those described for the Salmon River except, in 1982-83, all carcasses were examined for a disk tag. If present, the tag number was recorded and the tag was removed from the carcass.

Escapement Estimation

Escapement of coho adults was estimated from a spawner-day index of five tributaries: Blue, Boise, Fish Hatchery, Forestry and Slough creeks. These tributaries were selected on the basis of three criteria: the streams supported major spawning populations; they were distributed through most of the coho range; and assessment was relatively consistent during the three year study. Spawner-day estimates for each stream were summed to produce an annual index of spawner abundance. The index was calibrated from the 1982-83 mark-recapture data to estimate escapement in 1981-82 and 1983-84.

In 1982-83, adult escapement was estimated from mark-recapture data which were stratified into three areas delineated by the First and Second canyons (Fig. 4). Stratification was necessary because coho adults held in the mainstem near their ultimate spawning location. Escapement was calculated using Schaefer's formula (Ricker 1975), with 95% confidence limits calculated using Pearson's formula. Estimates of male and female escapement were calculated by applying the ratio of the individual estimates to the pooled population estimate.

Adipose Fin Clip Incidence

The escapement of AFC coho adults was the product of the AFC incidence in a sample and the escapement estimate. Because the spawning ground samples showed a consistent positive bias, it was necessary to estimate the AFC incidence from other sources. The AFC incidence in the disk tag application sample was used in 1982-83 and 1983-84 (1983-84 data were from an aborted mark-recapture study); however, because an independent sample was unavailable in 1981-82, the AFC incidence in the spawning ground sample was adjusted by 0.78, the 1982-83 and 1983-84 mean ratio of AFC incidence observed in the disk tag application and spawning ground recovery samples.

Escapement By CWT Code

The escapement by CWT code and long term CWT loss was calculated by applying the CWT composition of the spawning ground sample, adjusted for carcass decomposition and predator activity when necessary (see Salmon River), to the estimated escapement of AFC coho adults. Because up to three codes returned in a single year, CWT loss represented an average for those codes.

RESULTS

Mark-Recapture

Disk Tag Application: A total of 692 coho adults and 18 jacks were released with disk tags from November 13 to 23, 1982 (Appendix 19). Of the above, 71 adults were missing the adipose fin. Condition at release was generally good, with the exception 13 adults which required ventilation. The proportion of this group recovered on the spawning grounds (0%) was significantly lower ($p < 0.05$; difference in proportions test) than that of coho released in good condition (9.5%). We concluded that these fish were subject to tagging related mortality and, therefore, they were eliminated from the disk tag application total.

The sex of all coho released with disk tags was recorded during tagging operations; however, the accuracy of sex identification at this stage was limited because, in many cases, the development of sexually dimorphic traits was not advanced and internal examinations could not be made. Recorded sex was compared in the 45 disk tagged adults for which both application and recovery data were available (Appendix 21). Three of the 27 fish initially identified as females were male (11.1%); all fish initially identified as males were male.

When adjusted for tagging related mortality, sex identification error and disk tag loss (from Schubert et al. 1985), an estimated 428 adult males, 228 females and 18 jacks were released with disk tags (Appendix 20).

Carcass Recovery: A total of 627 coho adults and 12 coho jacks were recovered during foot surveys conducted in 1982-83 (Appendix 18b). Of the adults, 298 were male, 322 were female, and 7 were unsexed; 62 were disk tagged and 87 had AFCs (Appendix 20). Three of the jacks had AFCs.

The incidence of adult carcasses marked with disk tags ranged from 0% during November 9-12 to 17.6% during December 14-21 (Appendix 22a). The only significant differences in disk tag incidence occurred between December 14-21 and both January 10-17 and January 24-28 ($p < 0.05$; difference in proportions test). Disk tag incidence by recovery location ranged from 0% in a number of minor return areas to 14.3% in Blue Creek (Appendix 22b). Disk tag incidence totaled 4.5%, 11.6% and 13.6% in the lower, middle and upper areas, respectively; however, only the lower and upper areas were significantly different ($p < 0.05$).

Sample Selectivity by Length and Sex: Size related biases in the disk tag application and carcass recovery samples were examined using a Kolmogorov-Smirnov two-sample test (Sokal and Rohlf 1981). Bias in the application sample was assessed by comparing the continuous length-frequency distributions of the disk tagged and untagged spawning ground recoveries. Recovery bias was assessed by partitioning the application sample into recovered and nonrecovered components and comparing the continuous length-frequency distributions of each. No differences were detected either in the total sample or by sex ($p > 0.05$), indicating the application and recovery samples were unbiased with respect to size.

Sex related biases were examined by partitioning the application and recovery samples as above and comparing the sex compositions within each (Appendix 22c). The sex ratios of recovered and nonrecovered disk tagged coho were not significantly different ($p > 0.05$; difference in proportions test), indicating the recovery sample was unbiased with respect to sex; however, the proportion male was significantly ($p < 0.05$) higher in disk tagged versus untagged spawning ground recoveries, indicating the application sample was biased toward males.

Escapement Estimate: The 1982-83 escapement of upper Pitt River coho adults was estimated at 7,297 (Appendix 23). The upper and lower 95% confidence limits were 8,359 and 6,146, respectively. The escapement of female and male adults totaled 3,291 and 4,006, respectively.

Estimation of Spawner Population

Total Escapement: A total of 16,206, 26,211 and 12,735 spawner-days were recorded in the five upper Pitt River index areas in 1981-82, 1982-83 and 1983-84, respectively (Appendix 24). The total escapement in 1981-82 and 1983-84, calculated by applying the 1982-83 ratio of the mark-recapture estimate and spawner-day index to the 1981-82 and 1983-84 spawner-day indices, was estimated at 4,512 and 3,545, respectively (Appendix 24).

Adipose Fin Clipped Adults: AFC incidence in the spawning ground sample totalled 17.6%, 13.4% and 2.8% in 1981-82, 1982-83 and 1983-84, respectively (Appendix 25). In contrast, AFC incidence in the disk tag application sample was 10.3% and 2.2% in 1982-83 and 1983-84, respectively, an average of 0.78 of the incidence in the respective spawning ground samples. Although the difference approached statistical significance only in 1982-83 ($p < 0.05$), it was consistent with observations reported in the Birkenhead River (Schubert **et al.** 1985); therefore, the escapement of AFC coho adults was estimated from the disk tag application sample in 1982-83 (10.3%) and 1983-84 (2.2%) and from the adjusted the spawning ground sample in 1981-82 (13.7%).

Escapement of AFC coho adults and escapement by CWT code are detailed in Appendix 26 and Table 6, respectively. In 1981-82, an estimated 617 coho adults returned with AFCs, of which 240 were from the 1979 age 1+ release (code 02 16 60), 270 were from the 1979 age 0+ release (code 02 16 62)

Table 6. Summary of juvenile releases, adult escapements and survivals to adult escapement of coded wire tagged upper Pitt River system coho salmon.

Recovery year	Release year	Dominant brood year [a]	CWT code	Number released[b]	Spawning ground recoveries Number	Spawning ground recoveries %	Estimated adipose clipped escapement	Survival (%)
1981-82	1979	1977	02 16 60	15,938	18	39.1	240	1.5
		1978	02 16 62	51,841	20	43.5	270	0.5
			No tag	-	8	17.4	107	-
1982-83	1979	1978	02 16 62	51,841	4	4.8	36	0.6 [c]
	1980	1978	02 18 02	13,428	30	35.7	267	2.0
		1979	02 18 03	60,592	38	45.2	339	0.6
			No tag	-	12	14.3	107	-
1983-84	1980	1979	02 18 03	60,592	4	100.0	66	0.7 [d]
			No tag	-	0	0.0	11	-

a Based on juvenile release sample (Schubert and Fedorenko 1985).
b Adjusted for long term CWT loss.
c Includes escapement recorded in 1981-82.
d Includes escapement recorded in 1982-83.

and 107 (17.4%) had lost the CWT. In 1982-83, an estimated 749 coho adults returned with AFCs, of which 36 were from the 1979 age 0+ fry release, 267 were from the 1980 age 1+ release (code 02 18 02), 339 were from the 1980 age 0+ fry release (code 02 18 03) and 107 (14.3%) had lost the CWT. In 1983-84, an estimated 77 coho adults returned with AFCs, of which 66 were from the 1980 age 0+ release and 11 (1982-83 CWT loss) had lost the CWT.

CWT Loss

Long term CWT loss was estimated at 17.4%, 14.3% and 0% in 1981-82, 1982-83 and 1983-84, respectively (Table 6); however, the sample in 1983-84 was inadequate to provide reliable results. Predator activity and carcass decomposition did not influence apparent CWT loss.

Survival

Estimated survival for coho juveniles tagged primarily at age 0+ (adjusted for long term CWT loss) to three year old and combined three and four year old escapement averaged 0.5% and 0.6%, respectively (Table 6). Estimated survival for coho juveniles tagged primarily at age 1+ to four year old escapement averaged 1.8%.

Straying

Straying of AFC adults to non-release sites could not be assessed because escapement was not estimated by spawning area. Some indication of the level of straying can be derived from observed AFC carcasses in the recovery sample (Appendix 25). An estimated 4.3%, 3.6% and 0% of the AFC adults in 1981-82, 1982-83 and 1983-

Table 7. Age composition of upper Pitt River coho salmon.

Year	Sample type	Sample size	% by age		
			4_3	3_2	2_2
1981-82	Spawning ground	226	27.0	72.6	0.4
1982-83	Spawning ground	444	4.1	93.9	2.0
1983-84	Spawning ground	110	12.7	87.3	0.0
-	Average	-	14.6	84.6	0.8

84, respectively, were recovered in non-release areas; however, this may reflect intrasystem movement of juveniles rather than straying of adults.

Age/Length/Sex Composition

The age composition of upper Pitt River coho salmon recovered on the spawning grounds is detailed in Appendix 27 and summarized in Table 7. Spawning ground samples averaged 14.6% (range 4.1% to 27.0%) age 4_3, 84.6% (range 72.6% to 93.9%) age 3_2 and 0.8% (range 0.0% to 2.0%) age 2_2. As noted for previous studies, size related recovery bias may have resulted in an underestimate of age 2_2 returns.

Mean POH lengths of upper Pitt River coho recovered on the spawning grounds are detailed by year, sex and age in Appendix 27. POH length of adult males and females averaged 45.3 cm (range 42.0 cm to 47.1 cm) and 49.8 cm (range 46.8 cm to 53.2 cm), respectively.

Females comprised 57.3%, 55.4% and 41.8% of the adults in the spawning ground sample in 1981-82, 1982-83 and 1983-84, respectively.

DISCUSSION

Escapement Estimation Error

Error in escapement estimates derived from stream indices calibrated to base year escapements can occur if the base year estimate is biased or if the assumptions underlying the index system are invalid. Potential sources of error in escapement estimates for the upper Pitt River system are discussed below.

Base Year Escapement Estimate: Evaluation of bias in the 1982-83 mark-recapture estimate was critical to the overall study results because it formed the basis of the 1981-82 and 1983-84 estimates. The basic assumptions underlying the mark-recapture technique, discussed in detail by others (Cousens **et al.** 1982; Ricker 1975), were evaluated and, where possible, biases were eliminated. For example, stress-related differential recovery of disk tagged adults was addressed by eliminating all fish which exhibited stress at release; bias resulting from spatial stratification of the disk tag application sample was addressed analytically by using Schaefer's modification of the Petersen formula for stratified populations; sex bias in the application sample was addressed by computing escapement by sex. Three other assumptions specific to the design of the 1982-83 study are discussed below.

First, it was assumed that the entire escapement was vulnerable to capture in November while holding in the upper Pitt River mainstem. This assumption was evaluated by examining

the temporal pattern of disk tag incidence in the recovery sample. Continued immigration was indicated by the lower disk tag incidence in the last two weeks of the recovery period, suggesting the assumption was invalid. This was unlikely to have biased the study, however, because recovery effort was relatively representative over all time periods. Second, because of poor access, the study area was limited to that part of the upper Pitt River system downstream from the Garibaldi Park boundary. We assumed that the probability of migration above the Garibaldi Park boundary would be equal for disk tagged and untagged adults and that total emigration would be minor. An aerial survey in December reported less than 10% of the escapement holding above the study area, while a subsequent foot survey reported a disk tag incidence similar to that in the study area. It was concluded, therefore, that both assumptions were valid. Third, it was assumed that disk tag loss would be similar to that reported for the Birkenhead River (Schubert **et al.** 1985). Because disk tag application techniques and time out to recovery were similar, this assumption may have been valid; however, it was impossible to evaluate. Such assumptions should be avoided in future studies.

In summary, no uncorrected biases were identified in the upper Pitt River mark-recapture data. It was concluded, therefore, that the 1982-83 population estimate was not significantly biased.

Escapement Index: If the 1982-83 escapement estimate was unbiased, the accuracy of the 1981-82 and 1983-84 estimates was dependent upon the assumptions underlying the stream index. Three of the assumptions are discussed below.

First, spawners were assumed to be equally vulnerable to observation between years. The upper Pitt River index consisted of relatively small tributaries and used observers trained to work within the stream and to make every effort to dislodge coho from hiding places. In a study conducted under comparable conditions, Johnston **et al.** (1987) concluded that the number of coho detected was essentially independent of physical factors. We assumed, therefore, that changes in vulnerability to observation were unlikely to have influenced study results. Second, AUC data were considered the best index of fish abundance because of variable annual survey frequency; however, the AUC index assumed that average stream life was constant. Van den Berghe and Gross (1986) concluded that stream residence can vary with spawner density and body size. Since both factors changed over the study period, unquantifiable error may have been introduced into the 1981-82 and 1983-84 upper Pitt River escapement estimates. Third, it was assumed that the index represented a fixed proportion of the annual upper Pitt River escapement. Because the study was not designed to collect the time series of data required to evaluate this assumption, it's validity is unknown. Index areas were selected on the basis of survey coverage and included the largest spawning populations; however, we selected large sampling units with a wide range in escapement levels and which were distributed throughout the coho range to maximize the probability of representing the entire system. The index, therefore, was thought to be representative of the system. Ultimately, estimation precision is constrained by the underlying reliability of the technique. Johnston **et al.** (1987) concluded that most index systems were relatively imprecise indicators of absolute escapement, with coefficients of variation of only 50%. In the absence of a time series of evaluation data, it must be concluded that the estimates for 1981-82 and 1983-84 may be relatively imprecise.

Table 8. Juvenile and adult age composition estimates, by coded wire tag group, for upper Pitt River coho salmon.

CWT code	Sampled at	Year	Sample size	Age composition by brood year (%) 1977	1978	1979
02 16 60	Juvenile release	1979	126	80.8	19.2	0.0
	Spawning ground (adult)	1981	15	33.3	66.7	0.0
02 16 62	Juvenile release	1979	316	1.3	98.7	0.0
	Spawning ground (adult)	1981	15	6.7	93.3	0.0
		1982	3	0.0	0.0	100.0
02 18 02	Juvenile release	1980	189	0.0	95.7	4.3
	Spawning ground (adult)	1982	18	0.0	11.1	88.9
02 18 03	Juvenile release	1980	231	0.0	1.1	98.9
	Spawning ground (adult)	1982	26	0.0	3.8	96.2
		1983	1	0.0	0.0	100.0

Estimation of CWT Escapement

The higher AFC incidence in the spawning ground sample relative to the disk tag application sample in both 1982-83 and 1983-84 was consistent with results from a similar study conducted in the Birkenhead River (Schubert **et al.** 1985). This may reflect the focus of juvenile trapping efforts on slow moving, low gradient streams. Because carcass recovery in these areas may have been more efficient due to a lower rate of downstream displacement, an AFC incidence and AFC escapement estimated from the carcass recovery sample would have a positive bias.

Estimation of Age Composition

The age composition of upper Pitt River coho salmon was evaluated for each CWT code from both juvenile and adult scale samples (Table 8). No significant difference was noted in those CWT groups released as age 0+ juveniles (codes 02 16 62 and 02 18 03); however, significant differences were noted between the juvenile and adult samples for those CWT groups released as age 1+ juveniles (codes 02 16 60 and 02 18 02), with a considerably higher proportion of the adults assigned to the younger of the two brood years. Although a number of factors may be involved, it was concluded that the discrepancy largely reflects misinterpretation of age four spawning ground scales due to a loss of resolution in the freshwater portion of the scale. Scales from age 2+ smolts tended to show checks associated with migration and stress which might be difficult to interpret on an adult scale. This conclusion, consistent with the negative age bias in the above codes, was also consistent with the underaging of three coded wire tagged adults (code 02 16 62) recovered in 1982-83 (Table 8). This code was applied in 1979, probably to 1978 brood coho; all were aged as 1979 brood.

Three other factors may have contributed to the observed difference. First, adult sample sizes were small, totaling less than twenty in each of the groups; however, the magnitude and direction of the difference was non-random, suggesting a limited impact of sample size. Second, either or both of the juvenile and adult samples may have been biased. Juvenile sample bias was unlikely, both because efforts were made to ensure the sample was representative (Schubert and Fedorenko 1985) and because the expected bias would be opposite to that observed, assuming smaller, younger individuals were more vulnerable to sampling. Adult sample bias was rejected because all AFC recoveries were sampled and because the similar size of four and three year old coho (Appendix 27) made recovery bias unlikely. Third, brood-specific differential survival may have altered the brood year composition of the samples. Since the younger juveniles were the fastest growing and least stressed members of their brood, they may have survived at a higher rate than the slowest and most stressed members of the previous brood; however, if the samples were assumed unbiased and correctly aged, the observed differential survival would be at least an order of magnitude (5.2% vs. 0.6% for code 02 16 60; 41.1% vs. 0.2% for code 02 18 02). Such differences are unlikely.

SALWEIN CREEK

BACKGROUND

Salwein Creek is a small lowland stream which flows in a westerly direction for 3.2 km, entering the Vedder portion of the Vedder-Chilliwack River approximately 7 km upstream from the Fraser River (Fig. 5). The stream was described in a previous report documenting the juvenile component of this study (Schubert 1984).

The purpose of this study was to compare the harvest distribution, harvest rate and survival of the wild and cultured components of the Salwein Creek coho stock. An estimated 11,841 wild coho smolts were released with CWTs in the spring of 1982 (adjusted for long term CWT loss). A further 39,464 smolts cultured at the Chilliwack River Hatchery were released in two groups (spot and 24-hour releases) into Salwein Creek and 19,414 coho smolts were released at the Chilliwack River Hatchery. This report documents the total adult escapement and the escapement of AFC coho adults to Salwein Creek in 1983-84. Schubert and Lister (1986) published an analysis of the overall experiment.

METHODS

Fence Trap

Salwein Creek coho were enumerated at a fence trap, described previously, in 1982-83 and 1983-84. The return of AFC coho jacks was monitored from December 3, 1982 to March 7, 1983; however, the trap overflowed from December 23 to January 3 and on January 10 due to inadequate staffing and high flows, respectively (Appendix 28a). After January 23, monitoring was sporadic and daily records were not maintained. As a result, the jack return was not adequately assessed. An independent estimate was not made.

The return of AFC coho adults was monitored from November 25, 1983 to February 10, 1984. The trap overflowed from December 21 to 28 and January 4 to 7 due to ice formation and high flows, respectively (Appendix 28b). Since the trap could not provide a complete enumeration, a mark-recapture program was implemented to provide an independent estimate of adult escapement (described below).

The trap was inspected at least once per day, with more frequent inspections during periods of high

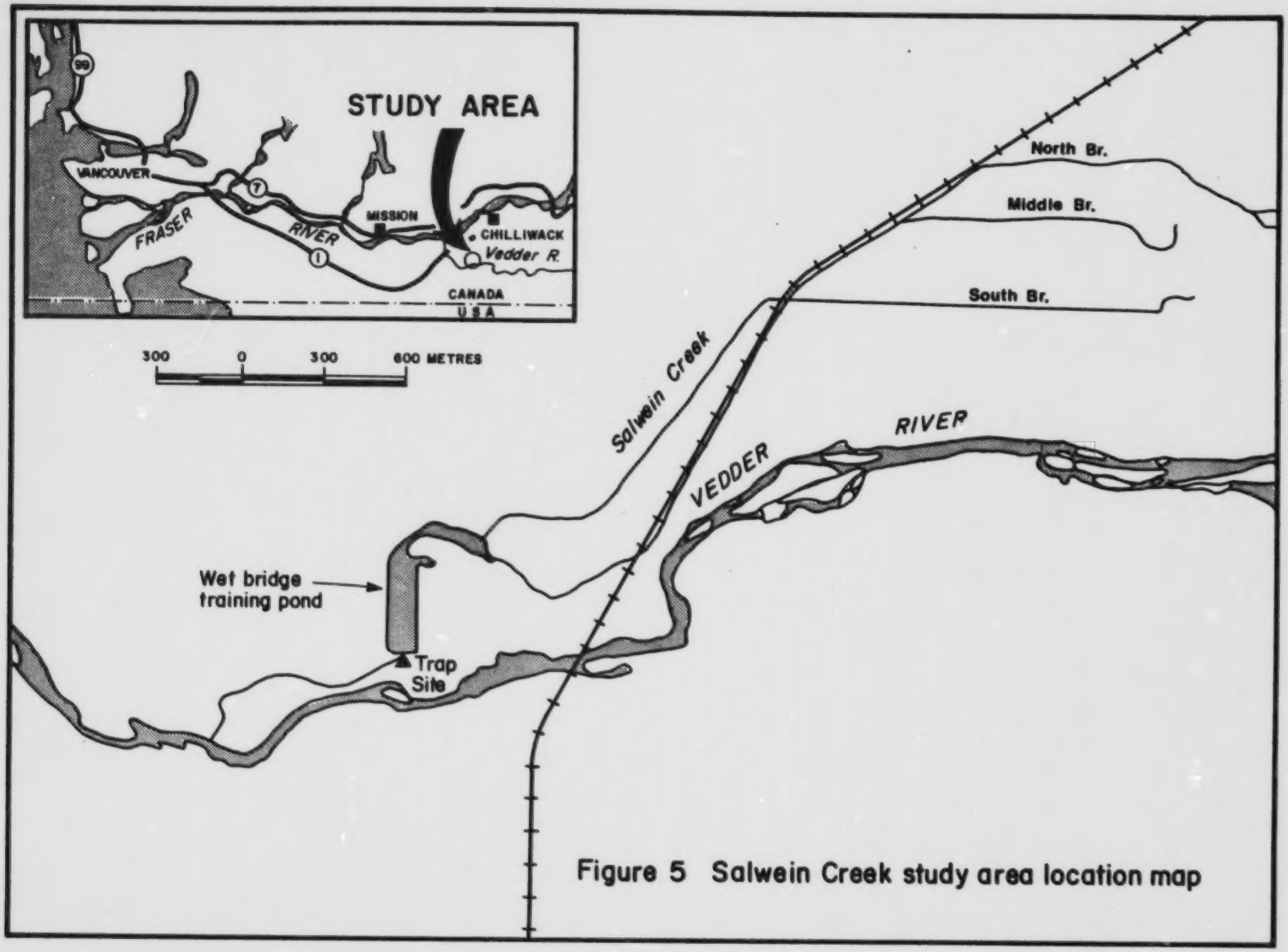

Figure 5 Salwein Creek study area location map

fish abundance. All fish were removed from the trap box with a dip net, enumerated by species and released above the trap. Coho were recorded as female, adult male or jack and AFCs were noted. Coho adults released with disk tags were also sampled, as described below. All AFC jacks were killed to determine the CWT code.

Mark-Recapture

After January 10, approximately 80% of the daily coho adult catch was disk tagged using the Petersen tagging system. As well, coho adults were captured with dip nets from pools near the spawning grounds on January 11 in order to disk tag that portion of the population which had previously migrated into the creek. The pools were isolated by stretching beach seines (1.8 m x 15 m x 1.2 cm mesh) across the creek both upstream and downstream from a pool. The coho were then captured, disk tagged and released.

Disk tagging procedures were similar to those described for the Vedder-Chilliwack River, except coho adults received a secondary mark consisting of a 0.7 cm diameter hole applied with a paper punch to fin rays near the base of the dorsal fin.

Date and location of tagging, disk tag number, NF length (±0.5 cm), sex and adipose fin status were recorded for each fish released with a disk tag. The condition of the fish at release was recorded as 1 (swam away rapidly), 2 (swam away slowly) or 3 (required ventilation) and any bleeding from the gills was noted.

Stream Surveys

Salwein Creek: Salwein Creek was surveyed on foot three times per week from January 13 to February 16, 1984. The survey procedure was similar to that described for the Salmon River except carcasses were examined for a secondary mark, then for a disk tag, to reduce potential bias associated with examining disk tagged fish more closely for secondary marks that untagged fish.

Other Streams: Other streams in the Vedder-Chilliwack River were surveyed by enhancement staff. Fence traps were operated in Post Creek and upper Chilliwack River, and foot surveys were conducted in Borden Creek on February 6, Hopedale Creek on February 16, Fourteen Mile Creek on January 10 and Fifteen Mile Creek on January 10 and February 6, 1984. Coho carcasses were enumerated and AFC carcasses were sampled, as described for the Salmon River.

Escapement Estimation

The data were inadequate to estimate the 1982-83 escapement of Salwein Creek coho jacks. The 1983-84 escapement of Salwein Creek coho adults was calculated from mark-recapture data using the Petersen formula (Chapman modification) (Ricker 1975), with 95% confidence limits calculated using Pearson's formula. Estimates of male and female escapement were calculated by applying the ratio of the individual estimates to the pooled population estimate.

Adipose Fin Clip Incidence

The escapement of AFC coho adults was estimated from the AFC incidence in the carcass recovery sample, the largest of the two available samples. Estimated AFC escapement was the product of the AFC incidence in the sample and the mark-recapture population estimate. Confidence limits ($p < 0.05$) were calculated as follows (Cochran 1977):

$$p \pm 1.96\ (se + fpc)$$

where: se = standard error

$$= \sqrt{(1-f)pq/(n-1)}$$

where: fpc = finite population correction
= 1/2n
n = sample size
p = AFC proportion
q = 1-p
f = n/N
N = population size.

Since N was estimated with 95% confidence limits, the upper (N_1) and lower (N_2) limits of N were substituted into the above and confidence limits around p were calculated for each. The final upper and lower confidence limits around p were the upper limit (p_1) calculated for N_1 and the lower limit (p_2) calculated for N_2. The upper and lower limits for the AFC coho adult escapement estimate, therefore, were $(N_1)(p_1)$ and $(N_2)(p_2)$.

Escapement By CWT Code

The escapement by CWT code and long term CWT loss was calculated by applying the CWT composition of the spawning ground sample to the estimated return of AFC coho adults. Because several CWT codes returned in a single year, CWT loss represented an average for those codes.

RESULTS

Fence Trap

1982-83: A total of 551 coho adults and 306 coho jacks were captured at the Salwein Creek trap from December 3, 1982 to March 7, 1983 (Appendix 28a). Of the above, 297 were AFC jacks, of which 44 returned with code 02 21 15 (wild), 64 with code 02 21 14 (cultured, spot release), 171 with code 02 22 46 (cultured, 24-hr release), 4 with code 02 22 31 (cultured, hatchery release), 11 with other hatchery production codes and three (1.0%) without a CWT. Because the entire escapement was not evaluated in 1982-83, the above represent minimum escapement estimates.

1983-84: A total of 328 coho adults and 62 coho jacks were captured at the Salwein Creek trap from November 25, 1983 to February 10, 1984 (Appendix 28b). Of the above, 292 adults and 28 jacks had AFCs.

Mark-Recapture

Disk Tag Application: A total of 161 coho adults were released with disk tags from January 10 to 30, 1984 (Appendix 29), of which all but 16 were captured at the trap. Condition at release was generally good, with the exception of 32 disk tagged adults which remained immediately above the fence until subsequent dead recovery. It was concluded that these fish were subject to tagging related stress and, therefore, were eliminated from the disk tag application total.

Sex identification error was evaluated by comparing the recorded sex of 70 disk tagged adults for which both application and recovery data were available (Appendix 30). Seven (14.0%) of the females and four (26.7%) of the males were misidentified during disk tag application.

When adjusted for tagging related stress and sex identification error, an estimated 42 adult males and 87 females were released with disk tags (Appendix 29).

Carcass Recovery: A total of 384 coho adults and 24 coho jacks were recovered on the spawning grounds or at the fence in 1983-84 (Appendix 31). Of the adults, 162 (42.2%) were male, 222 (57.8%) were female, 70 (18.2%) had disk tags and 330 (85.9%) had AFCs. No carcasses were recovered with a secondary mark only; however, dorsal fin erosion was sufficient to preclude detection of a secondary mark on 5.7% of the carcasses. The use of a dorsal fin mark is not recommended for future evaluations of primary tag loss.

Table 9. Summary of smolt releases, adult escapements and survivals to adult escapement of coded wire tagged 1980 brood Salwein Creek coho salmon.

CWT group		Number	Spawning ground recoveries		Estimated adipose clipped	Survival
Description	Code	released[a]	Number	%	escapement	(%)
Wild	02 21 15	11,841	194	58.8	506	4.3
Hatchery release	02 22 31	19,414	1	0.3	3	N/A
Spot release	02 21 14	19,419	58	17.6	151	N/A
24 h release	02 22 46	20,045	66	20.0	171	N/A
No tag	--	-	11	3.3	29	N/A

a Adjusted for long term CWT loss.

Eighty-five carcasses were recovered at the fence (Appendix 32). Relative to spawning ground recoveries, these fish showed a significantly higher incidence of disk tags (43.8% vs. 12.7%) and a significantly lower spawning success (16.1% vs. 93.0%) ($p < 0.01$; difference in proportions test) (Appendix 33), suggesting nonrandom mixing in the population as a result of tagging stress. Fence recoveries were eliminated from the sample, reducing the census and disk tag recovery samples to 299 and 38, respectively (Appendix 32).

The weekly incidence of disk tagged adult carcasses ranged from 0% to 22.9% (Appendix 34), with significant differences ($p < 0.05$; difference in proportions test) between most weeks, suggesting that the disk tag application sample was not representative over time.

Sample Selectivity by Length and Sex: Size related biases in the disk tag application and carcass recovery samples were examined using a Kolmogorov-Smirnov two-sample test. Bias in the recovery sample was further assessed by stratifying the samples in 5 cm NF increments and comparing recovery rates between strata (Appendix 35). No size biases were noted ($p > 0.05$) in either the application or recovery samples.

Sex related biases, examined in a similar way, showed the recovery sample was unbiased but the application sample was biased toward females ($p < 0.05$) (Appendix 36).

Estimation of Spawner Population

Total Escapement: The 1983-84 escapement of coho adults, calculated from mark-recapture data (Appendix 37), was 1,000 with upper and lower 95% confidence limits of 1,360 and 734, respectively. The escapement of female and male adults totaled 484 and 516, respectively.

Adipose Fin Clipped Adults: The 1983-84 escapement of AFC adults was estimated at 859, with upper and lower 95% confidence limits of 1,211 and 612, respectively. Of that total, an estimated 506 were from the wild release, 325 were from the cultured releases and 29 (3.3%) had lost the CWT (Appendix 38, Table 9). CWT loss was not influenced by carcass decomposition or predators.

Table 10. Age composition of Salwein Creek coho salmon.

Year	Sample type	Sample size	% by age		
			4_3	3_2	2_2
1983-84	Spawning ground	146	1.4	97.9	0.7

Straying

Three adults of Salwein Creek origin were recovered in other areas in 1983-84, one wild coho adult in Post Creek and two cultured coho adults (code 02 22 46) in Borden Creek. The estimated escapement of these codes was two wild coho adults in Post Creek and four cultured coho adults in Borden Creek.

Age/Length/Sex Composition

The age composition of wild Salwein Creek coho salmon recovered on the spawning grounds is detailed in Appendix 39 and summarized in Table 10. Cultured coho were removed from the sample because fish culture practices can influence the return of jacks and because age 4_3 individuals were not represented. Of the wild adults, 1.4% were age 4_3 and 98.6% were age 3_2. Jacks comprised 0.7% of the aged wild coho sampled on the spawning grounds; however, size selective sampling bias likely resulted in an underestimate of the proportion of jacks in the escapement. Jacks comprised 48.6% of the catch of wild (unmarked) coho observed at the fence (Appendix 28b) but only 1.8% of the wild and cultured coho sampled on the spawning grounds (Appendix 31).

Mean POH lengths of Salwein Creek spawning ground recoveries are detailed by sex and age in Appendix 39. Adult males and females averaged 42.6 cm and 42.3 cm, respectively. No difference ($p > 0.05$, difference in proportions) was noted between wild and cultured groups.

Females comprised 58.2% of the coho adult fence trap catch (Appendix 28b), 57.8% of the coho adult carcass recovery sample (Appendix 31) and 48.4% of the final population estimate. The proportion of females in the spawning ground sample was significantly less ($p < 0.05$) in the wild group (48.4%) than in the cultured groups (69.9%).

DISCUSSION

Escapement Estimation Error

The basic assumptions underlying the mark-recapture technique were evaluated and, where possible, biases were eliminated from our data. For example, stress-related differential recovery of disk tagged adults was addressed by removing all fish which exhibited measurable stress at release; sex misidentification was addressed by correcting the release data based on a comparative sex identification of disk tagged fish in the application and recovery samples; temporal bias in the disk tag application sample was addressed by conducting frequent, intensive recovery surveys over the entire die off period; sex bias in the application sample was addressed by calculating escapement by sex.

Differences in spawning success and disk tag incidence in the fence and spawning ground samples indicated that the fence recoveries had not mixed randomly in the population, possibly because of handling and tagging stress. We attempted to correct the bias by removing these fish from the recovery sample; however, it was not possible to recover carcasses in the pond immediately above the trap. Although it would have been difficult for stressed fish to move up the fishway into the pond, a positive estimation bias of unknown magnitude may have occurred if disk tagged adults were disproporionately lost in the pond.

CAMPBELL RIVER

BACKGROUND

The Campbell River is a small lowland stream which flows in a westerly direction for approximately 26 km, entering Semiahmoo Bay 1.5 km north of the Canada-United States International Boundary (Fig. 6). The stream was described in a previous report documenting the juvenile component of this study (Schubert 1983).

The juvenile capture and tagging study was conducted in the spring of 1982. An estimated 15,637 coho smolts captured at a fence trap were released with CWTs (adjusted for short term CWT loss). Adult returns in 1983-84 were enumerated by Semiahmoo Fish and Game Club (SFGC) volunteers at a fence trap located approximately 7.5 km upstream from the mouth. The SFGC conduct annual escapement monitoring and brood stock collection programs in the watershed. Unfortunately, since other assessment data were not collected, this report documents only the 1983-84 fence counts of coho adults and AFC coho adults.

METHODS

Fence Trap

An adult fence trap was installed on a set of concrete abutments and sill located approximately 7.5 km upstream. The fence, constructed of welded steel (approximate dimensions of 1.2 m x 12.2 m), was installed perpendicular to the flow. The fence consisted of six centrally pivoted gates, which could be rotated to remove debris, with a trap and live box at one end.

The trap was monitored from October 1, 1983 to February 15, 1984. Trap efficiency was reduced during high water on November 14, 24 and 25. The trap was inspected at least once per day. All fish were removed from the trap box with a dip net, enumerated by species and released above the trap. Coho were recorded as adult or jack and AFC were noted. A subsample was retained for hatchery brood stock. No other samples were obtained at the fence.

Stream Surveys

Foot surveys were not conducted either upstream or downstream from the fence site in 1983-84.

Escapement Estimation

The 1983-84 escapement estimate was the count of coho adults and AFC coho adults recorded at the fence. Short term CWT loss was estimated from the 1982 release sample (Schubert 1983); it was assumed that all CWTs were code 02 22 62.

RESULTS

A total of 1,897 coho adults and 1,099 coho jacks were enumerated at the fence in 1983-84; of that total, 991 adults and 47 jacks had AFCs (Appendix 40). Assuming a CWT loss of 3.88% (Schubert 1983), an estimated

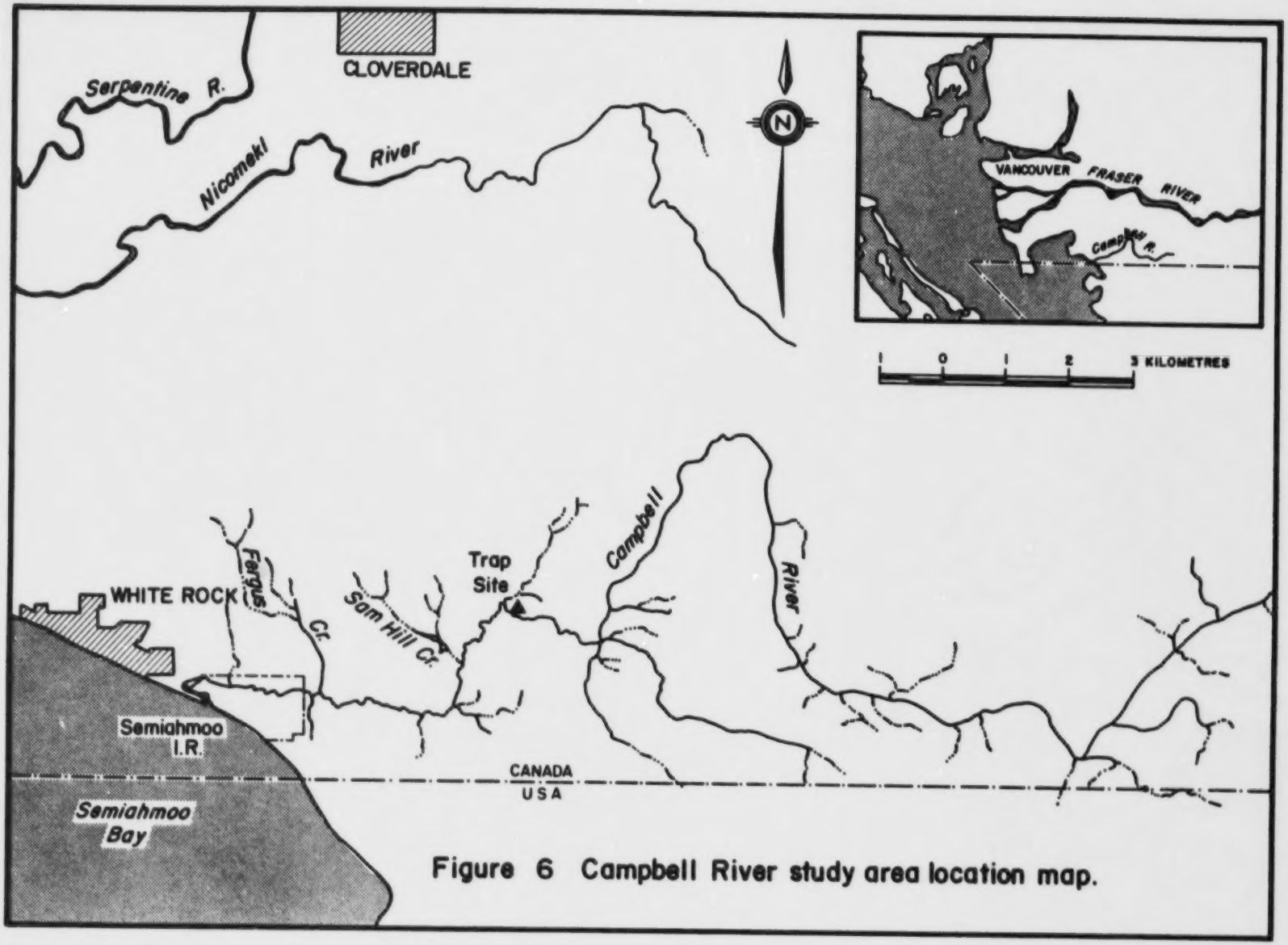

Figure 6 Campbell River study area location map.

Table 11. Summary of smolt release, adult escapement and survival to adult escapement of coded wire tagged Campbell River coho salmon.

Recovery year	Release year	Dominant brood year	CWT code	Number released[a]	Spawning ground recoveries Number	%	Estimated adipose clipped escapement[b]	Survival (%)
1983-84	1982	1980	02 22 62	15,637	0	-	953	6.1
			No tag	-	0	-	38	-

a Adjusted for short term CWT loss.
b Based on fence count.

953 coho adults returned with code 02 22 62 and a further 38 had lost the CWT (Table 11). Survival to escapement was estimated at 6.1%.

DISCUSSION

Escapement Estimation Error

Error in the estimation of the escapement of coded wire tagged coho adults may have arisen from two sources. First, our inability to estimate long term CWT loss may have resulted in an overestimate of the escapement of AFC adults with CWTs. For example, CWT loss in Vedder-Chilliwack River and Salmon River coho increased from an average 1.4% and 1.0% at release to 8.0% and 9.4% on the spawning grounds, respectively. Studies in the Birkenhead (Schubert **et al.** 1985) and Cowichan-Koksilah (Lister **et al.** 1981) estimated long term CWT loss at 9.1% and 9.3%, respectively; however, because both release and escapement estimates were adjusted for CWT loss, error would bias harvest rate rather than survival estimates. Second, the fence count may underestimate actual escapement because downstream spawning areas were not enumerated (visual observations in 1984-85 indicated less than 10% of the total escapement spawned in those areas) and because the fence overflowed on several occasions. While both factors would introduce a negative bias into the escapement estimate, the magnitude of the bias is unknown.

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APPENDICES

Appendix 1a. Summary of CWT release information for Vedder-Chilliwack River coho smolts, 1976 to 1978.

Year	Code	Release Site	Release Period	Number released with CWTs a
1976	02 15 13	Hopedale Creek	Apr 27 to Jun 25	8,702
		Ryder Creek	May 5 to Jun 15	1,249
		Salwein Creek	Apr 27 to Jun 22	6,543
		Street Creek	May 4 to Jun 15	1,021
		Total	-	17,515
1977	02 04 13	Fifteen Mile Creek	Apr 29 to Jun 7	1,201
		Hopedale Creek	Apr 6 to Jun 6	4,010
		Post Creek	Apr 29 to Jun 7	1,196
		Ryder Creek	Apr 14 to Jun 7	3,758
		Salwein Creek	Apr 14 to Jun 6	9,024
		Street Creek	Apr 5 to Jun 6	1,490
		Total	-	20,679
1978	02 21 24	Barrett Creek	Apr 12 to Jun 7	5,078
		Fifteen Mile Creek	Apr 16 to Jun 6	819
		Hopedale Creek	Apr 11 to Jun 8	8,247
		Post Creek	Apr 18 to May 23	952
		Ryder Creek	Apr 12 to Jun 7	4,684
		Salwein Creek	Apr 10 to Jun 7	11,787
		Street Creek	Apr 10 to Jun 1	1,751
		Total	-	31,567

a. Release figures from Fedorenko and Cook (1982) adjusted for long term CWT loss (see text).

Appendix 1b. Summary of CWT release information for upper Chilliwack River coho fry, 1976 to 1979.

Year	Code	Release Site	Release Period	Number released with CWTs a
1976	02 15 11	Chilliwack Lake	Oct 26 to Dec 16	20,630
1977	02 21 20	Chilliwack Lake	Oct 18 to Dec 16	4,934
1978	02 21 30	Chilliwack Lake	Oct 13 to Nov 21	13,676
1979	02 17 60	Chilliwack Lake	Sep 6 to Oct 15	23,583

a. Release figures from Fedorenko and Cook (1982) adjusted by average CWT loss observed in Vedder-Chilliwack CWT studies (8.0%).

Appendix 2. Daily fence trap catches of coho salmon in Hopedale Creek (Vedder-Chilliwack system), 1978-79.

Date	Adipose Present			Adipose Absent			Catch	
	Male	Female	Jack	Male	Female	Jack	Total	Cum.
06-Nov	-	-	-	-	-	-	0	0
07-Nov a	-	-	-	-	-	-	0	0
08-Nov a	-	-	-	-	-	-	0	0
09-Nov	-	-	-	-	-	-	0	0
10-Nov	-	-	-	-	-	-	0	0
11-Nov	-	-	-	-	-	-	0	0
12-Nov	-	-	-	-	-	-	0	0
13-Nov	-	-	-	-	-	-	0	0
14-Nov	-	-	-	-	-	-	0	0
15-Nov	-	-	-	-	-	-	0	0
16-Nov	-	-	-	-	-	-	0	0
17-Nov	-	-	-	-	-	-	0	0
18-Nov	-	-	-	-	-	-	0	0
19-Nov	-	-	-	-	-	-	0	0
20-Nov	-	-	-	-	-	-	0	0
21-Nov	-	-	-	-	-	-	0	0
22-Nov	-	-	-	-	-	-	0	0
23-Nov	-	-	-	-	-	-	0	0
24-Nov	-	-	-	-	-	-	0	0
25-Nov	-	-	-	-	-	-	0	0
26-Nov	-	-	-	-	-	-	0	0
27-Nov	-	-	-	-	-	-	0	0
28-Nov	-	-	-	-	-	-	0	0
29-Nov	-	-	-	-	-	-	0	0
30-Nov	-	-	-	-	-	-	0	0
01-Dec	-	-	-	-	-	-	0	0
02-Dec	-	-	-	-	-	-	0	0
03-Dec	-	-	-	-	-	-	0	0
04-Dec	-	-	-	-	-	-	0	0
05-Dec	2	-	-	-	-	-	2	2
06-Dec	-	-	-	-	-	-	0	2
07-Dec	-	-	-	-	-	-	0	2
08-Dec	-	-	-	-	-	-	0	2
09-Dec	-	-	-	-	-	-	0	2
10-Dec	-	-	-	-	-	-	0	2
11-Dec	-	-	-	-	-	-	0	2
12-Dec	-	-	-	-	-	-	0	2
13-Dec	-	-	-	-	-	-	0	2
14-Dec	-	-	-	-	-	-	0	2
15-Dec	-	-	-	-	-	-	0	2
16-Dec	-	-	-	-	-	-	0	2
17-Dec	-	-	-	-	-	-	0	2
18-Dec	-	-	-	-	-	-	0	2
19-Dec	-	-	-	-	-	-	0	2
20-Dec	1	-	-	-	-	-	1	3
21-Dec	-	-	-	-	-	-	0	3
22-Dec	1	2	-	3	1	-	7	10
23-Dec	2	1	-	-	-	-	3	13
24-Dec	1	1	-	1	-	-	3	16

Appendix 2. Daily fence trap catches of coho salmon in Hopedale Creek (Vedder-Chilliwack system), 1978-79.

Date	Adipose Present			Adipose Absent			Catch	
	Male	Female	Jack	Male	Female	Jack	Total	Cum.
25-Dec	1	-	-	-	-	-	1	17
26-Dec	-	-	-	-	-	-	0	17
27-Dec	-	-	-	-	-	-	0	17
28-Dec	-	-	-	-	-	-	0	17
29-Dec	-	-	-	-	-	-	0	17
30-Dec	-	-	-	-	-	-	0	17
31-Dec	-	-	-	-	-	-	0	17
01-Jan	-	-	-	-	-	-	0	17
02-Jan	-	1	-	-	-	-	1	18
03-Jan	-	-	-	-	-	-	0	18
04-Jan	-	-	-	-	-	-	0	18
05-Jan	-	-	-	-	-	-	0	18
06-Jan	-	-	-	-	-	-	0	18
07-Jan	-	-	-	-	-	-	0	18
08-Jan	-	-	-	-	-	-	0	18
09-Jan	-	-	-	-	-	-	0	18
10-Jan	1	-	1	-	-	-	2	20
11-Jan	-	-	-	-	-	-	0	20
12-Jan	-	-	-	-	-	-	0	20
13-Jan	1	-	-	-	-	-	1	21
14-Jan	-	-	-	-	-	-	0	21
15-Jan	1	-	-	-	-	-	1	22
16-Jan	-	-	-	-	-	-	0	22
17-Jan	2	1	-	-	1	-	4	26
18-Jan	1	2	-	1	1	-	5	31
19-Jan	1	1	-	1	-	-	3	34
20-Jan	2	3	-	1	1	-	7	41
21-Jan	1	-	1	-	1	-	3	44
22-Jan	3	-	-	-	1	-	4	48
23-Jan	1	-	-	1	-	-	2	50
24-Jan	1	-	1	-	1	-	3	53
25-Jan	-	-	-	1	1	-	2	55
26-Jan	-	-	-	-	-	-	0	55
27-Jan	-	-	-	-	-	-	0	55
28-Jan	-	1	-	-	-	-	1	56
29-Jan	-	-	-	-	-	-	0	56
30-Jan	-	-	-	-	-	-	0	56
31-Jan	-	1	-	1	-	-	2	58
01-Feb	2	-	-	-	-	-	2	60
02-Feb	-	-	-	-	-	-	0	60
03-Feb	-	1	-	-	-	-	1	61
04-Feb	-	1	-	1	2	-	4	65
05-Feb	11	6	-	7	6	-	30	95
06-Feb	1	2	-	1	1	-	5	100
07-Feb	2	2	-	-	1	-	5	105
08-Feb	1	-	-	-	1	-	2	107
09-Feb	-	1	2	-	2	1	6	113
10-Feb	-	-	-	2	-	-	2	115
11-Feb	1	1	-	-	-	-	2	117

Appendix 2. Daily fence trap catches of coho salmon in Hopedale Creek (Vedder-Chilliwack system), 1978-79.

Date	Adipose Present			Adipose Absent			Catch	
	Male	Female	Jack	Male	Female	Jack	Total	Cum.
12-Feb	2	-	-	2	1	-	5	122
13-Feb	2	-	-	1	1	-	4	126
14-Feb	2	1	-	2	1	-	6	132
15-Feb	-	-	-	-	-	-	0	132
16-Feb	-	-	-	-	-	-	0	132
17-Feb	-	-	-	-	-	-	0	132
18-Feb	-	-	-	-	-	-	0	132
19-Feb	-	-	-	-	-	-	0	132
20-Feb	-	1	-	-	-	-	1	133
21-Feb	-	-	-	-	-	-	0	133
22-Feb	-	-	-	-	-	-	0	133
Total	47	30	5	26	24	1	133	133

a. Fence out due to high water.

Appendix 3. Daily fence trap catches of coho salmon in Ryder Creek (Vedder-Chilliwack system), 1978-79.

Date	Adipose Present			Adipose Absent			Catch	
	Male	Female	Jack	Male	Female	Jack	Total	Cum.
06-Nov	-	-	-	-	-	-	0	0
07-Nov	-	-	-	-	-	-	0	0
08-Nov	-	-	-	-	-	-	0	0
09-Nov	-	-	-	-	-	-	0	0
10-Nov	-	-	-	-	-	-	0	0
11-Nov	-	-	-	-	-	-	0	0
12-Nov	-	-	-	-	-	-	0	0
13-Nov	-	-	-	-	-	-	0	0
14-Nov	-	-	-	-	-	-	0	0
15-Nov	-	-	-	-	-	-	0	0
16-Nov	-	-	-	-	-	-	0	0
17-Nov	-	-	-	-	-	-	0	0
18-Nov	-	-	-	-	-	-	0	0
19-Nov	-	-	-	-	-	-	0	0
20-Nov	-	-	-	-	-	-	0	0
21-Nov	-	-	-	-	-	-	0	0
22-Nov	-	-	-	-	-	-	0	0
23-Nov	-	-	-	-	-	-	0	0
24-Nov	-	-	-	-	-	-	0	0
25-Nov	-	-	-	-	-	-	0	0
26-Nov	-	-	-	-	-	-	0	0
27-Nov	-	-	-	-	-	-	0	0
28-Nov	-	-	-	-	-	-	0	0
29-Nov	-	-	-	-	-	-	0	0
30-Nov	-	-	-	-	-	-	0	0
01-Dec	-	-	-	-	-	-	0	0
02-Dec	-	-	-	-	-	-	0	0
03-Dec	-	-	-	-	-	-	0	0
04-Dec	-	-	-	-	-	-	0	0
05-Dec	-	-	-	-	-	-	0	0
06-Dec	-	-	-	-	-	-	0	0
07-Dec	-	-	-	-	-	-	0	0
08-Dec	-	-	-	-	-	-	0	0
09-Dec	-	-	-	-	-	-	0	0
10-Dec	-	-	-	-	-	-	0	0
11-Dec	-	-	-	-	-	-	0	0
12-Dec	-	-	-	-	-	-	0	0
13-Dec	-	-	-	-	-	-	0	0
14-Dec	-	-	-	-	-	-	0	0
15-Dec	-	-	-	-	-	-	0	0
16-Dec	-	-	-	-	-	-	0	0
17-Dec	-	-	-	-	-	-	0	0
18-Dec	1	-	-	-	-	-	1	1
19-Dec	-	-	-	-	-	-	0	1
20-Dec	-	-	-	-	-	-	0	1
21-Dec	-	-	-	-	-	-	0	1
22-Dec	-	-	-	-	-	-	0	1
23-Dec	-	-	-	-	-	-	0	1
24-Dec	-	-	-	1	-	-	1	2

Appendix 3. Daily fence trap catches of coho salmon in Ryder Creek (Vedder-Chilliwack system), 1978-79.

	Adipose Present			Adipose Absent			Catch	
Date	Male	Female	Jack	Male	Female	Jack	Total	Cum.
25-Dec	-	-	-	-	-	-	0	2
26-Dec	-	-	-	-	-	-	0	2
27-Dec	-	-	-	-	-	-	0	2
28-Dec	-	-	-	-	-	-	0	2
29-Dec	-	-	-	-	-	-	0	2
30-Dec	-	-	-	-	-	-	0	2
31-Dec	-	-	-	-	-	-	0	2
01-Jan	-	-	-	-	-	-	0	2
02-Jan	-	-	-	-	-	-	0	2
03-Jan	-	-	-	-	-	-	0	2
04-Jan	-	-	-	-	-	-	0	2
05-Jan	-	-	-	-	-	-	0	2
06-Jan	-	-	-	-	-	-	0	2
07-Jan	-	-	-	-	-	-	0	2
08-Jan	-	-	-	-	-	-	0	2
09-Jan	-	-	-	-	-	-	0	2
10-Jan	-	-	-	-	-	-	0	2
11-Jan	-	-	-	-	-	-	0	2
12-Jan	1	-	-	-	-	-	1	3
13-Jan	-	-	-	-	-	-	0	3
14-Jan	-	-	-	-	-	-	0	3
15-Jan	-	-	-	-	-	-	0	3
16-Jan	-	-	-	-	-	-	0	3
17-Jan	-	-	-	-	-	-	0	3
18-Jan	-	-	-	-	-	-	0	3
19-Jan	-	-	-	-	-	-	0	3
20-Jan	5	4	-	3	-	-	12	15
21-Jan	7	2	-	4	1	-	14	29
22-Jan	2	-	-	-	-	-	2	31
23-Jan	4	-	-	2	1	-	7	38
24-Jan	2	2	-	1	-	-	5	43
25-Jan	2	2	-	1	-	-	5	48
26-Jan	2	-	-	-	1	-	3	51
27-Jan	2	1	-	1	1	-	5	56
28-Jan	1	1	-	2	2	-	6	62
29-Jan	2	-	-	-	-	-	2	64
30-Jan	-	-	-	-	-	-	0	64
31-Jan	-	1	-	1	-	-	2	66
01-Feb	-	-	-	-	2	-	2	68
02-Feb	2	3	-	-	-	-	5	73
03-Feb	-	-	-	-	2	-	2	75
04-Feb	3	-	-	-	2	-	5	80
05-Feb	10	18	-	3	8	-	39	119
06-Feb	29	26	-	24	18	-	97	216
07-Feb	14	5	-	6	11	-	36	252
08-Feb	13	3	-	7	2	-	25	277
09-Feb	-	-	-	-	-	-	0	277
10-Feb a	2	1	-	2	3	-	8	285
11-Feb a	3	1	-	1	2	-	7	292

Appendix 3. Daily fence trap catches of coho salmon in Ryder Creek (Vedder-Chilliwack system), 1978-79.

	Adipose Present			Adipose Absent			Catch	
Date	Male	Female	Jack	Male	Female	Jack	Total	Cum.
12-Feb a	1	5	-	6	1	-	13	305
13-Feb a	-	2	-	-	-	-	2	307
14-Feb a	1	2	-	-	-	1	4	311
15-Feb	-	-	-	-	1	-	1	312
16-Feb	-	-	-	-	1	-	1	313
17-Feb	-	-	-	-	-	-	0	313
18-Feb	-	-	-	-	-	-	0	313
19-Feb	1	-	-	-	-	-	1	314
20-Feb	-	-	-	-	-	-	0	314
21-Feb	-	-	-	-	-	-	0	314
22-Feb	2	-	-	-	-	-	2	316
Total	112	79	0	65	59	1	316	316

a. Fence out due to high water.

Appendix 4a. Daily fence trap catches of coho salmon in Salwein Creek (Vedder-Chilliwack system), 1977-78.

	Adipose Present			Adipose Absent			Catch	
Date	Male	Female	Jack	Male	Female	Jack	Total	Cum.
01-Dec	-	-	-	-	-	-	0	0
02-Dec	-	-	-	-	-	-	0	0
03-Dec	-	-	-	-	-	-	0	0
04-Dec	-	-	-	-	-	-	0	0
05-Dec	-	-	-	-	-	-	0	0
06-Dec	-	-	-	-	-	-	0	0
07-Dec	-	-	-	-	-	-	0	0
08-Dec	-	-	-	-	-	-	0	0
09-Dec	-	-	-	-	-	-	0	0
10-Dec	-	-	-	-	-	-	0	0
11-Dec	1	-	-	-	-	-	1	1
12-Dec	-	-	-	1	-	-	1	2
13-Dec	1	1	-	1	-	-	3	5
14-Dec	3	2	-	-	-	-	5	10
15-Dec	2	4	1	2	-	-	9	19
16-Dec	-	-	-	-	-	-	0	19
17-Dec	1	-	-	-	-	-	1	20
18-Dec	1	1	-	-	-	-	2	22
19-Dec	1	1	-	-	-	-	2	24
20-Dec	-	-	-	1	-	-	1	25
21-Dec	-	-	-	-	-	-	0	25
22-Dec	-	-	-	-	-	-	0	25
23-Dec	-	-	-	-	-	-	0	25
24-Dec	-	-	-	-	-	-	0	25
25-Dec	1	-	-	-	-	-	1	26
26-Dec	-	-	-	-	-	-	0	26
27-Dec	-	-	-	-	-	-	0	26
28-Dec	-	-	-	-	-	-	0	26
29-Dec	-	-	-	-	-	-	0	26
30-Dec	-	-	-	-	-	-	0	26
31-Dec	1	-	-	-	-	-	1	27
01-Jan							0	27
02-Jan							0	27
03-Jan			Trap out due to ice formation				0	27
04-Jan							0	27
05-Jan							0	27
06-Jan	-	-	-	-	-	-	0	27
07-Jan	-	-	-	-	-	-	0	27
08-Jan	1	-	-	-	-	-	1	28
09-Jan	1	-	-	-	-	-	1	29
10-Jan	1	2	-	1	-	-	4	33
11-Jan	5	4	-	-	1	-	10	43
12-Jan	7	12	-	8	-	-	27	70
13-Jan	12	11	-	1	1	-	25	95
14-Jan	2	2	-	-	-	-	4	99
15-Jan	1	1	1	2	-	-	5	104
16-Jan	25	8	-	-	-	-	33	137
17-Jan	13	13	-	1	1	1	29	166
18-Jan	1	4	-	3	1	-	9	175

Appendix 4a. Daily fence trap catches of coho salmon in Salwein Creek (Vedder-Chilliwack system), 1977-78.

Date	Adipose Present			Adipose Absent			Catch	
	Male	Female	Jack	Male	Female	Jack	Total	Cum.
19-Jan	2	5	-	-	-	-	7	182
20-Jan	5	5	-	-	2	1	13	195
21-Jan	3	2	-	2	1	-	8	203
22-Jan	21	18	-	5	2	-	46	249
23-Jan	8	7	-	1	2	-	18	267
24-Jan	10	3	-	-	1	-	14	281
25-Jan	1	3	1	-	-	-	5	286
26-Jan	6	6	-	-	2	-	14	300
27-Jan	3	4	1	1	1	-	10	310
28-Jan	1	7	1	-	2	1	12	322
29-Jan	1	2	-	-	1	-	4	326
30-Jan	1	1	-	-	-	-	2	328
31-Jan	-	-	-	1	-	-	1	329
01-Feb a	-	-	-	-	-	-	0	329
02-Feb	1	-	-	-	-	-	1	330
03-Feb a	-	-	-	-	-	-	0	330
04-Feb a	-	-	-	-	-	-	0	330
05-Feb a	-	-	-	-	-	-	0	330
06-Feb	21	17	-	4	3	-	45	375
07-Feb	21	65	16	5	12	-	119	494
08-Feb	27	31	5	6	9	-	78	572
09-Feb	8	10	2	1	3	1	25	597
10-Feb	1	4	3	-	-	-	8	605
11-Feb	1	2	-	-	2	-	5	610
12-Feb a	-	-	-	-	-	-	0	610
13-Feb	2	5	-	-	-	-	7	617
14-Feb a	-	-	-	-	-	-	0	617
15-Feb	-	1	-	-	-	-	1	618
Total	225	264	31	47	47	4	618	618

a. Trap was not checked.

Appendix 4b. Daily fence trap catches of coho salmon in Salwein Creek (Vedder-Chilliwack system), 1978-79.

Date	Adipose Present			Adipose Absent			Catch	
	Male	Female	Jack	Male	Female	Jack	Total	Cum.
16-Oct	-	-	-	-	-	-	0	0
17-Oct	-	-	-	-	-	-	0	0
18-Oct	-	-	-	-	-	-	0	0
19-Oct	-	-	-	-	-	-	0	0
20-Oct	-	-	-	-	-	-	0	0
21-Oct	-	-	-	-	-	-	0	0
22-Oct	-	-	-	-	-	-	0	0
23-Oct	-	-	-	-	-	-	0	0
24-Oct	-	1	-	-	-	-	1	1
25-Oct	-	-	-	-	-	-	0	1
26-Oct	-	-	-	-	-	-	0	1
27-Oct	-	-	-	-	-	-	0	1
28-Oct	-	-	-	-	-	-	0	1
29-Oct	-	-	-	-	-	-	0	1
30-Oct	-	-	-	-	-	-	0	1
31-Oct	-	-	-	-	-	-	0	1
01-Nov	-	-	-	-	-	-	0	1
02-Nov	-	-	-	-	-	-	0	1
03-Nov	-	-	-	-	-	-	0	1
04-Nov	-	-	-	-	-	-	0	1
05-Nov	-	-	-	-	-	-	0	1
06-Nov	-	-	1	2	1	2	6	7
07-Nov	1	-	-	-	-	-	1	8
08-Nov	1	-	-	1	1	-	3	11
09-Nov	-	1	-	1	-	-	2	13
10-Nov	1	1	-	-	1	5	8	21
11-Nov	-	-	-	-	-	-	0	21
12-Nov	-	-	-	-	-	-	0	21
13-Nov	-	-	-	-	-	-	0	21
14-Nov	-	-	-	-	-	-	0	21
15-Nov	-	-	-	-	-	-	0	21
16-Nov	-	-	-	-	-	-	0	21
17-Nov	-	-	-	-	-	-	0	21
18-Nov	-	-	-	-	-	-	0	21
19-Nov	-	-	-	-	-	-	0	21
20-Nov							0	21
21-Nov							0	21
22-Nov			Trap out due to ice formation				0	21
23-Nov							0	21
24-Nov							0	21
25-Nov	-	-	-	-	-	-	0	21
26-Nov	-	-	-	-	-	-	0	21
27-Nov	-	-	-	-	-	-	0	21
28-Nov	-	-	-	-	-	-	0	21
29-Nov	-	1	-	-	-	-	1	22
30-Nov	-	-	-	-	-	-	0	22
01-Dec	2	2	-	1	-	-	5	27
01-Dec	-	1	-	-	-	2	3	30
02-Dec	-	-	-	-	-	2	2	32

Appendix 4b. Daily fence trap catches of coho salmon in Salwein Creek (Vedder-Chilliwack system), 1978-79.

	Adipose Present			Adipose Absent			Catch	
Date	Male	Female	Jack	Male	Female	Jack	Total	Cum.
03-Dec	-	-	-	-	-	1	1	33
04-Dec	-	-	-	-	-	-	0	33
05-Dec	-	-	-	-	-	-	0	33
06-Dec	-	-	-	-	-	-	0	33
07-Dec	-	-	-	-	-	-	0	33
08-Dec	-	-	-	-	-	-	0	33
09-Dec	-	-	-	-	-	-	0	33
10-Dec	-	-	-	-	-	-	0	33
11-Dec	-	-	-	-	1	-	1	34
12-Dec	-	-	-	-	-	-	0	34
13-Dec	-	-	-	-	-	-	0	34
14-Dec	-	-	-	-	-	-	0	34
15-Dec	-	-	-	-	-	-	0	34
16-Dec	1	1	-	-	-	-	2	36
17-Dec	-	1	-	-	-	-	1	37
18-Dec	-	-	-	-	-	-	0	37
19-Dec	2	-	-	-	-	-	2	39
20-Dec	1	-	-	-	-	-	1	40
21-Dec	1	1	-	1	2	2	7	47
22-Dec	2	1	-	-	2	-	5	52
23-Dec	2	1	-	-	-	-	3	55
24-Dec	4	2	-	13	4	2	25	80
25-Dec	1	1	-	1	4	1	8	88
26-Dec	-	-	-	-	-	-	0	88
27-Dec	-	1	-	-	-	1	2	90
28-Dec							0	90
29-Dec							0	90
30-Dec							0	90
31-Dec							0	90
01-Jan							0	90
02-Jan							0	90
03-Jan			Trap out due to ice formation				0	90
04-Jan							0	90
05-Jan							0	90
06-Jan							0	90
07-Jan							0	90
08-Jan							0	90
09-Jan							0	90
10-Jan							0	90
11-Jan	1	-	-	1	1	-	3	93
12-Jan	-	-	-	-	2	1	3	96
13-Jan	-	1	-	1	1	1	4	100
14-Jan	1	2	-	1	1	-	5	105
15-Jan	-	6	-	3	-	2	11	116
16-Jan	-	1	-	-	2	-	3	119
17-Jan	-	1	-	-	-	-	1	120
18-Jan	-	1	-	-	-	-	1	121
19-Jan	-	-	-	-	-	-	0	121
20-Jan	2	5	-	1	-	1	9	130

Appendix 4b. Daily fence trap catches of coho salmon in Salwein Creek (Vedder-Chilliwack system), 1978-79.

	Adipose Present			Adipose Absent			Catch	
Date	Male	Female	Jack	Male	Female	Jack	Total	Cum.
21-Jan	37	36	-	33	29	4	139	269
22-Jan	9	11	-	10	12	1	43	312
23-Jan	7	10	-	10	16	1	44	356
24-Jan	2	11	-	2	11	2	28	384
25-Jan	-	1	-	2	1	-	4	388
26-Jan	-	-	-	-	1	-	1	389
27-Jan	-	1	-	-	-	-	1	390
28-Jan	-	1	-	-	-	-	1	391
29-Jan	-	-	-	-	2	-	2	393
30-Jan	-	1	-	-	-	-	1	394
31-Jan	-	1	-	1	-	-	2	396
01-Feb	-	-	-	-	-	-	0	396
02-Feb	-	-	-	-	-	-	0	396
03-Feb	-	-	-	-	-	-	0	396
04-Feb	-	-	-	-	-	-	0	396
05-Feb	2	-	-	-	3	-	5	401
06-Feb	10	15	-	6	17	-	48	449
07-Feb	22	30	1	21	21	-	95	544
08-Feb	4	14	-	14	20	1	53	597
09-Feb	3	1	-	1	1	1	7	604
10-Feb	5	5	-	9	7	-	26	630
11-Feb	1	2	-	5	6	-	14	644
12-Feb	9	5	-	11	19	2	46	690
13-Feb	2	2	-	2	7	-	13	703
14-Feb	1	3	-	-	3	-	7	710
15-Feb	-	-	-	1	-	-	1	711
16-Feb	1	-	-	-	-	-	1	712
17-Feb	-	-	-	-	-	-	0	712
18-Feb	-	-	-	-	-	-	0	712
19-Feb	2	1	-	-	2	-	5	717
20-Feb	-	3	-	-	2	-	5	722
21-Feb	-	-	-	-	-	-	0	722
22-Feb	1	1	-	-	-	-	2	724
23-Feb	-	-	-	-	-	-	0	724
Total	141	188	2	155	203	35	724	724

Appendix 4c. Daily fence trap catches of coho salmon in Salwein Creek (Vedder-Chilliwack system), 1979-80.

Date	Adipose Present			Adipose Absent			Catch	
	Male	Female	Jack	Male	Female	Jack	Total	Cum.
20-Nov	-	-	-	-	-	-	0	0
21-Nov	-	-	-	-	-	-	0	0
22-Nov	-	-	-	-	-	-	0	0
23-Nov	-	-	-	-	-	-	0	0
24-Nov	-	-	-	-	-	-	0	0
25-Nov	-	-	-	-	-	-	0	0
26-Nov	-	-	-	-	-	-	0	0
27-Nov	-	-	-	-	-	-	0	0
28-Nov	-	-	-	-	-	-	0	0
29-Nov	-	-	-	-	-	-	0	0
30-Nov	-	-	-	-	-	-	0	0
01-Dec	-	-	-	-	-	-	0	0
02-Dec	-	-	-	-	-	-	0	0
03-Dec	-	-	-	-	-	-	0	0
04-Dec	-	-	1	-	-	-	1	1
05-Dec a	3	4	33	33	21	-	94	95
06-Dec	3	9	52	63	66	-	193	288
07-Dec	1	2	15	7	10	-	35	323
08-Dec	1	-	1	1	1	-	4	327
09-Dec	-	-	8	2	6	-	16	343
10-Dec	-	-	8	7	12	-	27	370
11-Dec	-	-	3	4	4	-	11	381
12-Dec	-	-	-	-	-	-	0	381
13-Dec	-	-	-	-	-	-	0	381
14-Dec	-	-	1	3	1	-	5	386
15-Dec	1	-	-	-	1	-	2	388
16-Dec							0	388
17-Dec							0	388
18-Dec							0	388
19-Dec							0	388
20-Dec							0	388
21-Dec							0	388
22-Dec							0	388
23-Dec							0	388
24-Dec			Trap out due to high flows, ice				0	388
25-Dec							0	388
26-Dec							0	388
27-Dec							0	388
28-Dec							0	388
29-Dec							0	388
30-Dec							0	388
31-Dec							0	388
01-Jan							0	388
02-Jan							0	388
03-Jan	-	2	-	1	1	-	4	392
04-Jan	-	-	-	-	-	-	0	392
05-Jan							0	392
06-Jan							0	392
07-Jan							0	392

Appendix 4c. Daily fence trap catches of coho salmon in Salwein Creek (Vedder-Chilliwack system), 1979-80.

Date	Adipose Present			Adipose Absent			Catch	
	Male	Female	Jack	Male	Female	Jack	Total	Cum.
08-Jan							0	392
09-Jan			Trap out due to ice formation				0	392
10-Jan							0	392
11-Jan							0	392
12-Jan							0	392
13-Jan							0	392
14-Jan							0	392
15-Jan	-	-	1	1	2	-	4	396
16-Jan	-	-	-	1	-	-	1	397
Total	9	17	123	123	125	0	397	397

a. Trap overflowing due to milfoil buildup.

Appendix 5a. Daily fence trap catches of coho salmon in the upper Chilliwack River, 1978-79.

	Adipose Present			Adipose Absent			Catch	
Date	Male	Female	Jack	Male	Female	Jack	Total	Cum.
05-Oct	-	-	-	-	-	-	0	0
06-Oct	-	-	-	2	-	-	2	2
07-Oct	3	-	-	-	-	-	3	5
08-Oct a	12	11	-	1	1	-	25	30
09-Oct a	9	8	-	-	-	-	17	47
10-Oct a	2	4	1	-	-	-	7	54
11-Oct a	-	-	-	-	-	-	0	54
12-Oct a	-	-	-	-	-	-	0	54
13-Oct a	-	-	-	-	-	-	0	54
14-Oct a	-	-	-	-	-	-	0	54
15-Oct	1	7	-	-	-	-	8	62
16-Oct	2	4	1	-	-	-	7	69
17-Oct	-	-	-	-	-	-	0	69
18-Oct	4	3	-	1	-	-	8	77
19-Oct	4	3	-	-	-	-	7	84
20-Oct	18	17	1	1	3	-	40	124
21-Oct	-	1	-	-	-	-	1	125
22-Oct	-	-	2	-	1	-	3	128
23-Oct b	8	6	-	2	-	-	16	144
Total	63	64	5	7	5	0	144	144

a. Fence was not fish tight.

b. Fence washed out

Appendix 5b. Daily fence trap catches of coho salmon in the upper Chilliwack River, 1979-80.

Date	Adipose Present				Adipose Absent				Catch	
	Male	Female	Jack	Total a	Male	Female	Jack	Total a	Total	Cum.
01-Sep	-	-	-	0	-	-	-	0	0	0
02-Sep	-	-	-	0	-	-	-	0	0	0
03-Sep	-	-	-	0	-	-	-	0	0	0
04-Sep	-	-	-	0	-	-	-	0	0	0
05-Sep	-	-	-	0	-	-	-	0	0	0
06-Sep	-	-	-	0	-	-	-	0	0	0
07-Sep	-	-	-	0	-	-	-	0	0	0
08-Sep	-	-	-	0	-	-	-	0	0	0
09-Sep	-	-	-	0	-	-	-	0	0	0
10-Sep	-	-	-	0	-	-	-	0	0	0
11-Sep	-	-	-	0	-	-	-	0	0	0
12-Sep	-	-	-	0	-	-	-	0	0	0
13-Sep	-	-	-	0	-	-	-	0	0	0
14-Sep	-	-	-	0	-	-	-	0	0	0
15-Sep	-	-	-	0	-	-	-	0	0	0
16-Sep	-	-	-	0	-	-	-	0	0	0
17-Sep	-	-	-	0	-	-	-	0	0	0
18-Sep	-	-	-	0	-	-	-	0	0	0
19-Sep	-	-	-	0	-	-	-	0	0	0
20-Sep	-	-	-	0	-	-	-	0	0	0
21-Sep	-	-	-	0	-	-	-	0	0	0
22-Sep	-	-	-	0	-	-	-	0	0	0
23-Sep	-	-	-	0	-	-	-	0	0	0
24-Sep	-	-	-	0	-	-	-	0	0	0
25-Sep	-	-	-	0	-	-	-	0	0	0
26-Sep	-	-	-	0	-	-	-	0	0	0
27-Sep	1	-	-	1	-	-	-	1	2	2
28-Sep	2	1	-	3	-	-	-	3	6	8
29-Sep	-	-	-	0	-	-	-	0	0	8
30-Sep	-	-	-	0	-	-	-	0	0	8
01-Oct	-	1	-	1	-	1	-	1	2	10
02-Oct	-	-	-	0	-	-	-	0	0	10
03-Oct	1	2	-	3	-	-	-	0	3	13
04-Oct	2	1	-	3	-	-	-	0	3	16
05-Oct	2	1	-	3	-	-	-	0	3	19
06-Oct	2	-	-	2	-	-	-	0	2	21
07-Oct	2	1	-	3	-	-	-	0	3	24
08-Oct	3	3	-	6	-	-	-	0	6	30
09-Oct	6	11	-	17	-	1	-	1	18	48
10-Oct	5	7	-	12	-	-	-	0	12	60
11-Oct	6	4	-	14	-	-	-	0	14	74
12-Oct	3	3	-	46	-	-	-	1	47	121
13-Oct	6	1	1	74	1	-	-	1	75	196
14-Oct	7	8	-	55	-	2	-	2	57	253
15-Oct	11	10	-	65	-	-	-	0	65	318
16-Oct	7	4	-	109	-	-	-	0	109	427
17-Oct	10	5	-	72	2	-	-	3	75	502
18-Oct	1	3	-	30	-	1	-	2	32	534
19-Oct	2	-	-	43	-	-	-	0	43	577
20-Oct	3	2	-	13	1	-	-	1	14	591

Appendix 5b. Daily fence trap catches of coho salmon in the upper Chilliwack River, 1979-80.

Date	Adipose Present				Adipose Absent				Catch	
	Male	Female	Jack	Total a	Male	Female	Jack	Total a	Total	Cum.
21-Oct	6	3	1	21	-	-	-	0	21	612
22-Oct	10	10	-	217	1	-	-	1	218	830
23-Oct	28	48	-	968	1	2	1	25	993	1823
24-Oct	-	1	-	3	-	-	-	0	3	1826
25-Oct b	-	-	-	3	-	-	-	0	3	1829
Total	126	130	2	1787	6	7	1	42	1829	1829

a. Includes fish flashed through fence; sex unknown.

b. Fence washed out.

Appendix 5c. Daily fence trap catches of coho salmon in the upper Chilliwack River, 1980-81.

Date	Adipose Present				Adipose Absent				Catch	
	Male	Female	Jack	Total a	Male	Female	Jack	Total a	Total	Cum.
12-Sep	-	-	-	0	-	-	-	0	0	0
13-Sep	-	-	-	0	-	-	-	0	0	0
14-Sep	-	-	-	0	-	-	-	0	0	0
15-Sep	-	-	-	0	-	-	-	0	0	0
16-Sep b	-	-	-	0	-	-	-	0	0	0
17-Sep b	-	2	-	2	-	-	-	0	2	2
18-Sep b	-	-	-	0	-	-	-	0	0	2
19-Sep b	-	-	-	0	-	-	-	0	0	2
20-Sep b	-	-	-	0	-	-	-	0	0	2
21-Sep b	-	-	-	0	-	-	-	0	0	2
22-Sep b	-	-	-	0	-	-	-	0	0	2
23-Sep b	-	-	-	0	-	-	-	0	0	2
24-Sep b	-	-	-	0	-	-	-	0	0	2
25-Sep b	-	-	-	0	-	-	-	0	0	2
26-Sep b	-	1	-	1	-	-	-	0	1	3
27-Sep b	3	1	-	9	-	-	-	0	9	12
28-Sep b	2	4	-	6	-	-	-	0	24	36
29-Sep	-	-	-	0	-	-	-	0	0	36
30-Sep b	2	1	-	3	2	-	-	2	5	41
01-Oct	2	3	-	5	1	-	-	1	6	47
02-Oct	2	1	-	3	-	-	-	0	3	50
03-Oct	-	-	-	0	-	-	-	0	0	50
04-Oct	1	-	-	1	-	-	-	0	1	51
05-Oct	-	4	-	4	-	-	-	0	4	55
06-Oct	4	6	-	10	-	-	-	0	10	65
07-Oct	4	3	-	7	-	-	-	0	7	72
08-Oct	5	5	-	10	-	1	-	1	11	83
09-Oct	-	-	-	0	-	-	-	0	0	83
10-Oct	1	5	-	6	-	-	-	0	6	89
11-Oct	1	3	-	4	-	-	-	0	4	93
12-Oct	-	-	-	0	-	-	-	0	0	93
13-Oct	-	-	-	0	-	-	-	0	0	93
14-Oct	-	-	-	0	-	-	-	0	0	93
15-Oct	-	-	-	0	-	-	-	0	0	93
16-Oct	-	-	-	0	-	-	-	0	0	93
17-Oct	-	-	-	0	-	-	-	0	0	93
18-Oct	-	-	-	0	-	-	-	0	0	93
19-Oct	-	-	-	0	-	-	-	0	0	93
20-Oct	-	-	-	0	-	-	-	0	0	93
21-Oct	-	-	-	0	-	-	-	0	0	93
22-Oct	-	2	1	3	-	-	-	0	3	96
23-Oct	4	5	-	9	-	-	-	0	9	105
24-Oct	2	3	-	5	-	-	-	0	5	110
25-Oct	6	5	-	11	-	-	-	0	11	121
26-Oct	3	14	-	35	1	1	-	2	37	158
27-Oct	1	2	-	3	-	-	-	1	4	162
28-Oct	3	1	-	7	-	-	-	0	7	169
29-Oct	-	-	-	28	-	-	-	1	29	198
30-Oct	-	-	-	32	-	-	-	0	32	230
31-Oct	-	-	-	299	-	-	-	6	305	535

Appendix 5c. Daily fence trap catches of coho salmon in the upper Chilliwack River, 1980-81.

Date	Adipose Present				Adipose Absent				Catch	
	Male	Female	Jack	Total a	Male	Female	Jack	Total a	Total	Cum.
01-Nov c	1	2	-	180	-	-	-	5	439	974
Total	47	73	1	683	4	2	0	19	974	974

a. Includes fish flashed through fence; sex and/or adipose status unknown.
b. Trap was not fish tight.
c. Fence washed out.

Appendix 5d. Daily fence trap catches of coho salmon in the upper Chilliwack River, 1981-82.

Date	Adipose Present				Adipose Absent				Catch	
	Male	Female	Jack	Total	Male	Female	Jack	Total	Total	Cum.
19-Sep	2	1	-	3	-	-	-	0	3	3
20-Sep	-	-	-	0	-	-	-	0	0	3
21-Sep	-	-	-	0	-	-	-	0	0	3
22-Sep	-	-	-	0	-	-	-	0	0	3
23-Sep	-	-	-	0	-	-	-	0	0	3
24-Sep	-	-	-	0	-	-	-	0	0	3
25-Sep	-	-	-	0	-	-	-	0	0	3
26-Sep	-	-	-	0	-	-	-	0	0	3
27-Sep	2	1	-	3	-	-	-	0	3	6
28-Sep	1	2	-	3	-	-	-	0	3	9
29-Sep	1	-	-	1	-	-	-	0	1	10
30-Sep	-	-	-	0	-	-	-	0	0	10
01-Oct	-	1	-	1	-	-	-	0	1	11
02-Oct	-	-	-	0	-	-	-	0	0	11
03-Oct	-	-	-	0	-	-	-	0	0	11
04-Oct	-	-	-	0	-	-	-	0	0	11
05-Oct	-	-	-	0	-	-	-	0	0	11
06-Oct a	-	-	-	0	-	-	-	0	0	11
07-Oct a	-	-	-	0	-	-	-	0	0	11
08-Oct a	-	-	-	0	-	-	-	0	0	11
09-Oct a	-	-	-	0	-	-	-	0	0	11
10-Oct a	-	-	-	0	-	-	-	0	0	11
11-Oct b	1	-	-	1	-	-	-	0	1	12
12-Oct b	-	1	-	1	-	-	-	0	1	13
13-Oct b	2	3	-	5	-	-	-	0	5	18
14-Oct b	-	1	-	1	-	-	-	0	1	19
15-Oct b	-	1	-	1	-	-	-	0	1	20
16-Oct b	-	-	-	0	-	1	-	1	1	21
17-Oct b	-	1	-	1	-	-	-	0	1	22
18-Oct b	-	3	-	3	-	1	-	1	4	26
19-Oct b	6	7	-	13	1	-	-	1	14	40
20-Oct c	3	3	-	6	-	-	-	0	6	46
21-Oct b	2	1	-	3	-	-	-	0	3	49
22-Oct b	1	-	-	1	-	-	-	0	1	50
23-Oct b	4	5	-	9	1	1	-	2	11	61
24-Oct b	2	5	-	7	-	2	-	2	9	70
25-Oct c	3	7	-	10	-	-	-	0	10	80
26-Oct b	17	17	-	34	1	2	-	3	37	117
27-Oct b	11	11	-	22	-	-	-	0	22	139
Total	58	71	0	129	3	7	0	10	139	139

a. Fence removed due to high water.

b. Catch removed for hatchery culture.

c. Most of catch removed for hatchery culture.

Appendix 6a. Summary of live observations and dead counts of coho salmon in Vedder-Chilliwack River tributaries, 1977-78.

Location	Date	Live Count	Dead Recoveries								Total Dead
			Adipose Present				Adipose Absent				
			Male	Female	Jack	Total	Male	Female	Jack	Total	
Barrett Creek	Dec 19	2	0	0	0	0	0	0	0	0	0
	Jan 3	0	0	0	0	0	0	1	0	1	1
	Jan 6	0	4	0	0	4	1	0	0	1	5
	Jan 19	65	14	13	0	27	5	6	0	11	38
	Jan 26	56	33	25	0	58	3	9	0	12	70
	Feb 9	50	19	22	0	41	1	1	0	2	43
	Total	-	70	60	0	130	10	17	0	27	157
Borden Creek	Dec 13	25	0	0	0	0	0	0	0	0	0
	Dec 30	21	0	0	0	0	0	0	0	0	0
	Jan 9	69	0	1	0	1	0	0	0	0	1
	Jan 21	34	1	1	0	2	0	0	0	0	2
	Jan 26	33	0	3	0	3	0	0	0	0	3
	Jan 30	27	0	3	0	3	0	0	0	0	3
	Feb 6	18	0	1	0	1	0	0	0	0	1
	Feb 8	22	0	1	0	1	0	1	0	1	2
	Feb 9	14	0	0	0	0	0	0	0	0	0
	Feb 13	9	0	0	0	0	0	0	0	0	0
	Total	-	1	10	0	11	0	1	0	1	12
Depot Creek	Dec 15	9	0	1	0	1	0	0	0	0	1
	Jan 3	0	0	1	0	1	0	0	0	0	1
	Total	-	0	2	0	2	0	0	0	0	2
Fifteen Mile Creek	Dec 14	147	1	8	0	9	0	0	0	0	9
	Dec 23	-	5	4	0	9	1	0	0	1	10
	Jan 9	-	9	11	0	20	0	0	0	0	20
	Jan 18	40	10	14	0	24	2	4	0	6	30
	Jan 23	12	21	21	0	42	1	1	0	2	44
	Feb 10	0	6	9	0	15	0	0	0	0	15
	Total	-	52	67	0	119	4	5	0	9	128
Foley Creek	Jan 9	7	3	0	0	3	0	0	0	0	3
Ford Slough	Dec 19	0	1	0	0	1	0	0	0	0	1
	Dec28	2	0	2	0	2	0	0	0	0	2
	Jan 6	5	3	1	0	4	0	0	0	0	4
	Jan 10	0	0	1	0	1	0	0	0	0	1
	Total	-	4	4	0	8	0	0	0	0	8
Fourteen Mile Creek	Jan 9	3	0	4	0	6	0	1	0	1	7
	Jan 11	0	2	4	0	6	0	0	0	0	6

Appendix 6a. Summary of live observations and dead counts of coho salmon in Vedder-Chilliwack River tributaries, 1977-78.

Location	Date	Live Count	Dead Recoveries								Total Dead
			Adipose Present				Adipose Absent				
			Male	Female	Jack	Total	Male	Female	Jack	Total	
	Jan 23	1	1	3	0	4	0	0	0	0	4
	Feb 10	0	1	0	0	1	0	0	0	0	1
	Total	-	4	11	0	17	0	1	0	1	18
Frosst Creek	Jan 27	2	0	2	0	2	0	0	0	0	2
Gunther Ditch	Dec 19	2	0	0	0	0	0	0	0	0	0
	Jan 10	2	0	1	0	1	0	0	0	0	1
	Jan 19	0	1	1	0	2	0	0	0	0	2
	Jan 31	1	3	3	0	6	0	0	0	0	6
	Total	-	4	5	0	9	0	0	0	0	9
Hopedale Creek	Dec 5	1	0	1	0	1	0	0	0	0	1
	Dec 12	0	0	1	0	1	0	0	0	0	1
	Dec 20	60	0	0	0	0	1	2	0	3	3
	Dec 29	32	5	12	0	17	3	6	0	9	26
	Jan 4	2	3	5	0	8	0	1	0	1	9
	Jan 9	5	1	1	0	2	3	1	0	4	6
	Jan 13	40	8	14	0	22	5	6	0	11	33
	Jan 17	6	0	1	0	1	2	0	0	2	3
	Jan 19	130	11	11	0	22	6	7	0	13	35
	Jan 25	189	19	16	0	35	10	15	0	25	60
	Jan 30	84	15	10	0	25	3	5	0	8	33
	Jan 31	-	15	9	0	24	8	8	0	16	40
	Feb 7	180	30	41	0	71	13	9	0	22	93
	Total	-	107	122	0	229	54	60	0	114	343
Hopedale Slough	Dec 20	1	0	0	1	1	0	0	0	0	1
	Dec 29	2	0	0	0	0	0	0	0	0	0
	Jan 4	3	0	0	0	0	0	0	0	0	0
	Jan 9	50	1	1	0	2	0	0	0	0	2
	Jan 13	12	0	0	0	0	1	0	0	1	1
	Jan 17	14	1	2	0	3	0	0	0	0	3
	Jan 25	16	3	3	0	6	1	3	0	4	10
	Jan 30	9	1	1	0	2	0	0	0	0	2
	Feb 7	30	3	3	0	6	1	1	0	2	8
	Total	-	9	10	1	20	3	4	0	7	27
Liumchen Creek	Jan 11	0	0	0	0	0	0	0	0	0	0
	Jan 25	18	0	0	0	0	0	0	0	0	0
	Feb 9	5	0	0	0	0	0	0	0	0	0
	Total	-	0	0	0	0	0	0	0	0	0

Appendix 6a. Summary of live observations and dead counts of coho salmon in Vedder-Chilliwack River tributaries, 1977-78.

Location	Date	Live Count	Dead Recoveries								Total Dead
			Adipose Present				Adipose Absent				
			Male	Female	Jack	Total	Male	Female	Jack	Total	
Nesakwatch Creek	Dec 18	29	0	1	0	1	0	0	0	0	1
	Jan 9	13	3	2	0	5	0	0	0	0	5
	Jan 23	15	5	7	0	12	0	1	0	1	13
	Total	-	8	10	0	18	0	1	0	1	19
Paleface Creek	Dec 15	56	0	1	0	1	0	0	0	0	1
Post Creek	Dec 14	216	3	2	0	5	0	0	0	0	5
	Jan 3	100	7	5	0	12	0	0	0	0	12
	Jan 9	50	0	0	0	0	0	1	0	1	1
	Jan 16	50	22	24	0	46	0	0	0	0	46
	Jan 20	25	3	4	0	7	1	0	0	1	8
	Total	-	35	35	0	70	1	1	0	2	72
Ryder Creek	Dec 28	0	1	0	0	1	0	0	0	0	1
	Jan 3	12	0	0	0	0	0	0	0	0	0
	Jan 9	8	1	1	0	2	0	0	1	1	3
	Jan 13	59	0	2	0	2	0	1	0	1	3
	Jan 17	87	2	0	0	2	1	2	0	3	5
	Jan 23	26	1	1	0	2	2	1	1	4	6
	Jan 27	40	0	1	0	1	0	0	0	0	1
	Han 30	61	4	8	0	12	1	2	0	3	15
	Feb 6	30	0	3	0	3	0	0	0	0	3
	Feb 8	108	2	7	0	9	0	1	0	1	10
	Feb 13	61	5	9	0	14	0	3	0	3	17
	Total	-	16	32	0	48	4	10	2	16	64
Salwein Creek	Dec 13	0	2	0	0	2	0	0	0	0	2
	Dec 16	13	0	0	0	0	0	0	0	0	0
	Dec 29	3	0	3	0	3	0	1	0	1	4
	Jan 13 a	2	2	2	0	4	0	0	0	0	4
	Jan 18	15	2	3	0	5	1	0	0	1	6
	Jan 19	9	1	3	0	4	0	0	0	0	4
	Jan 26	77	2	4	0	6	0	2	0	2	8
	Jan 27 b	-	0	2	0	2	0	0	0	0	2
	Jan 31	61	8	10	0	18	2	5	0	7	25
	Feb 6 b	-	1	2	0	3	0	0	0	0	3
	Total	-	18	29	0	47	3	8	0	12	58
Sleese Creek	Dec 30	1	1	1	0	2	0	0	0	0	2
	Jan 3	0	1	0	0	1	0	0	0	0	1
	Jan 12	0	0	0	0	0	0	0	0	0	0

Appendix 6a. Summary of live observations and dead counts of coho salmon in Vedder-Chilliwack River tributaries, 1977-78.

Location	Date	Live Count	Dead Recoveries								Total Dead
			Adipose Present				Adipose Absent				
			Male	Female	Jack	Total	Male	Female	Jack	Total	
	Total	-	2	1	0	3	0	0	0	0	3
Street Creek	Dec 12	0	1	0	0	1	0	0	0	0	1
	Dec 13	4	1	3	0	4	0	0	0	0	4
	Dec 20	4	1	1	0	2	0	1	0	1	3
	Dec 29	1	1	0	0	1	0	0	0	0	1
	Jan 3	0	2	1	0	3	0	1	0	1	4
	Jan 4	7	0	2	0	2	0	2	0	2	4
	Jan 9	25	1	3	0	4	0	0	0	0	4
	Jan 13	50	4	3	0	7	0	1	0	1	8
	Jan 17	65	2	4	0	6	0	0	0	0	6
	Jan 24	69	17	33	0	50	2	8	0	10	60
	Jan 30	-	6	10	0	16	0	2	0	2	18
	Feb 7	30	7	10	0	17	1	3	0	4	21
	Total	-	43	70	0	113	3	18	0	21	134
Sweltzer River	Nov 21	0	0	0	0	0	0	0	0	0	0
	Nov 28	17	4	0	0	4	0	0	0	0	4
	Dec 5	80	0	2	0	2	0	0	0	0	2
	Dec 12	-	0	3	0	3	0	0	0	0	3
	Dec 22	-	5	4	0	9	0	0	0	0	9
	Jan 4	15	8	5	0	13	0	0	0	0	13
	Jan 9	10	6	3	0	9	0	0	0	0	9
	Jan 13	10	3	4	0	7	0	0	0	0	7
	Jan 24	3	3	6	0	9	0	0	0	0	9
	Total	-	29	27	0	56	0	0	0	0	56
Tamahi Creek	Jan 10	1	0	0	0	0	0	0	0	0	0
	Jan 25	4	0	0	0	0	0	0	0	0	0
	Feb 9	1	0	0	0	0	0	0	0	0	0
	Total	-	0	0	0	0	0	0	0	0	0

a. Incomplete survey.

b. Carcasses recovered on the fence.

Appendix 6b. Summary of live observations and dead counts of coho salmon in the Vedder-Chilliwack River mainstem, 1977-78.

Location	Date	Live Count	Dead Recoveries								
			Adipose Present				Adipose Absent				Total Dead
			Male	Female	Jack	Total	Male	Female	Jack	Total	
Area 1	Nov 18	0	1	1	0	2	0	0	0	0	2
	Nov 21	0	1	3	0	4	0	0	0	0	4
	Nov 25	0	0	1	0	1	0	0	0	0	1
	Dec 20	0	6	1	0	7	0	0	0	0	7
	Dec 28	0	0	0	0	0	0	1	0	1	1
	Dec 29	0	2	4	0	6	0	0	0	0	6
	Total	-	10	10	0	20	0	1	0	1	21
Area 2	Nov 24	0	0	0	0	0	0	0	1	1	1
	Dec 19	1	1	2	0	3	0	0	0	0	3
	Dec 28	4	2	2	0	4	0	0	0	0	4
	Jan 6	0	3	1	0	4	0	2	0	2	6
	Total	-	6	5	0	11	0	2	1	3	14
Area 3	Nov 17	0	3	0	0	3	0	0	0	0	3
	Dec 9	0	0	2	0	2	0	0	0	0	2
	Dec 19	0	0	1	0	1	0	0	0	0	1
	Dec 28	3	1	4	0	5	0	1	0	1	6
	Jan 6	0	2	4	0	6	0	0	0	0	6
	Jan 11	0	9	6	0	15	2	1	0	3	18
	Feb 9	0	5	8	0	13	1	0	0	1	14
	Total	-	20	25	0	45	3	2	0	5	50
Area 4	Dec 5	3	0	0	0	0	0	0	0	0	0
	Dec 9	3	0	0	0	0	0	0	0	0	0
	Dec 13	7	0	0	0	0	0	0	0	0	0
	Dec 19	14	2	3	0	5	0	0	0	0	5
	Dec 22	0	0	0	0	0	1	0	0	1	1
	Dec 28	10	2	3	0	5	0	0	0	0	5
	Jan 3	0	1	0	0	1	0	0	0	0	1
	Jan 6	0	0	1	0	1	0	0	0	0	1
	Jan 12	20	7	6	0	13	0	0	0	0	13
	Total	-	12	13	0	25	1	0	0	1	26
Area 5	Nov 28	0	0	1	0	1	0	0	0	0	1
	Dec 20	1	0	1	0	1	0	0	0	0	1
	Dec 28	0	2	2	0	4	0	0	0	0	4
	Jan 11	7	0	1	0	1	0	0	0	0	1
	Jan 31	-	1	0	0	1	0	0	0	0	1
	Total	-	3	5	0	8	0	0	0	0	8
Area 6	Nov 30	0	1	1	0	2	1	0	0	1	3

Appendix 6b. Summary of live observations and dead counts of coho salmon in the Vedder-Chilliwack River mainstem, 1977-78.

Location	Date	Live Count	Dead Recoveries								Total Dead
			Adipose Present				Adipose Absent				
			Male	Female	Jack	Total	Male	Female	Jack	Total	
	Dec 22	8	9	10	0	19	0	0	0	0	19
	Jan 11	25	4	6	0	10	0	0	0	0	10
	Total	-	14	17	0	31	1	0	0	1	32
Area 8	Nov 22	75	0	0	0	0	0	0	0	0	0
	Nov 29	100	0	1	0	1	0	0	0	0	1
	Dec 7	47	2	2	0	4	0	0	0	0	4
	Dec 21	60	13	11	0	24	0	0	0	0	24
	Dec 30	-	5	2	0	7	0	0	0	0	7
	Jan 3	70	20	6	0	26	0	0	0	0	26
	Jan 10	31	36	17	0	53	0	0	1	1	54
	Feb 10	3	17	3	0	20	0	0	0	0	20
	Total	-	93	42	0	135	0	0	1	1	136
Area 9	Nov 22	80	0	1	0	1	0	0	0	0	1
	Nov 29	90	0	0	0	0	0	0	0	0	0
	Dec 8	85	0	0	0	0	0	0	0	0	0
	Dec 21	135	11	6	0	17	1	0	0	1	18
	Jan 3	90	16	8	0	24	0	0	0	0	24
	Jan 10	25	9	6	0	15	0	0	0	0	15
	Total	-	36	21	0	57	1	0	0	1	58
Grand Total		-	194	138	0	332	6	5	2	13	345

Area 1 - Mouth to B.C. Hydro railroad bridge.
Area 2 - RR bridge to Barrett Creek.
Area 3 - Barrett Creek to Vedder Crossing.
Area 4 - Vedder Crossing to Liumchen Creek.
Area 5 - Liumchen Creek to Tamihi Creek.
Area 6 - Tamihi Creek to Slesse Creek.
Area 7 - Slesse Creek to Chipmunk Creek.
Area 8 - Chipmunk Creek to Center Creek.
Area 9 - Center Cr. to Chilliwack Lake outlet.

Appendix 7a. Summary of live observations and dead counts of coho salmon in Vedder-Chilliwack River tributaries, 1978-79.

Location	Date	Live Count	Dead Recoveries								Total Dead
			Adipose Present				Adipose Absent				
			Male	Female	Jack	Total	Male	Female	Jack	Total	
Barrett Creek	Oct 31	0	0	0	0	0	0	0	0	0	0
	Dec 14	2	0	0	0	1	0	0	0	0	1
	Dec 28	8	0	2	0	3	0	0	0	0	3
	Jan 2	10	0	0	0	0	0	0	0	0	0
	Jan 12	5	2	1	0	3	0	0	0	0	3
	Jan 19	8	2	1	0	3	0	0	0	0	3
	Jan 25	-	1	2	0	3	0	1	0	1	4
	Jan 26	44	1	1	0	5	0	1	0	2	7
	Feb 1	16	3	11	1	15	0	1	0	1	16
	Feb 7	47	8	10	0	18	2	0	0	2	20
	Feb 20	39	4	10	0	26	0	0	0	2	28
	Feb 21	-	0	0	0	0	2	0	0	2	2
	Feb 22	-	0	0	0	0	0	1	0	1	1
	Total	-	21	38	1	77	4	4	0	11	88
Borden Creek	Nov 16	0	0	0	0	0	0	0	0	0	0
	Nov 24	3	0	0	0	0	0	0	0	0	0
	Dec 4	2	0	0	0	0	0	0	0	0	0
	Dec 12	0	0	0	0	0	0	0	0	0	0
	Dec 18	0	0	0	0	0	0	0	0	0	0
	Jan 18	3	0	0	0	0	0	0	0	0	0
	Jan 22	68	1	0	0	1	0	0	0	0	1
	Jan 24	58	0	0	0	0	0	0	0	0	0
	Jan 29	36	0	0	0	0	0	0	0	0	0
	Jan 31	15	1	2	0	3	0	0	0	0	3
	Feb 5	7	0	0	0	0	0	0	0	0	0
	Feb 9	36	5	8	0	13	1	0	0	1	14
	Feb 13	88	1	2	0	5	0	0	0	0	5
	Total	-	8	12	0	22	1	0	0	1	23
Depot Creek	Nov 17	1	0	0	0	0	0	0	0	0	0
	Nov 24	2	0	0	0	0	0	0	0	0	0
	Nov 29	6	0	0	0	0	0	0	0	0	0
	Dec 5	2	0	0	0	0	0	0	0	0	0
	Dec 13	14	2	1	0	5	0	0	0	0	5
	Dec 19	12	2	0	0	3	0	0	0	0	3
	Dec 28	3	0	0	0	0	0	0	0	0	0
	Total	-	4	1	0	8	0	0	0	0	8
Fifteen Mile Creek	Nov 15	0	0	0	0	0	0	0	0	0	0
	Dec 6	13	1	1	0	2	0	0	0	1	3
	Dec 11	31	2	2	0	6	0	0	0	0	6
	Dec 18	26	2	6	0	9	0	0	0	0	9
	Dec 29	25	1	9	0	17	0	0	0	0	17

Appendix 7a. Summary of live observations and dead counts of coho salmon in Vedder-Chilliwack River tributaries, 1978-79.

Location	Date	Live Count	Dead Recoveries								Total Dead
			Adipose Present				Adipose Absent				
			Male	Female	Jack	Total	Male	Female	Jack	Total	
	Jan 4	2	2	2	0	9	0	0	0	0	9
	Jan 12	4	0	2	0	4	0	0	0	0	4
	Jan 19	24	0	5	0	14	0	0	0	0	14
	Jan 23	13	4	10	0	14	2	0	0	2	16
	Jan 30	1	0	0	0	15	0	0	0	1	16
	Feb 6	0	0	2	0	3	0	0	0	0	3
	Feb 14	0	0	0	0	5	0	0	0	0	5
	Total	-	12	39	0	98	2	0	0	4	102
Foley Creek	Nov 14	0	0	0	0	0	0	0	0	0	0
	Nov 27	60	0	0	0	0	0	0	0	0	0
	Dec 6	77	0	0	0	1	0	0	0	0	1
	Dec 12	80	0	0	0	0	0	0	0	0	0
	Dec 19	125	0	0	0	2	0	0	0	0	2
	Jan 26	68	1	3	0	7	0	1	0	1	7
	Total	-	1	3	0	10	0	1	0	1	10
Ford Slough	Nov 14	0	0	0	0	0	0	0	0	0	0
	Nov 20	0	0	0	0	0	0	0	0	0	0
	Dec 14	0	0	0	0	0	0	0	0	0	0
	Total	-	0	0	0	0	0	0	0	0	0
Forsyte Side Channel	Nov 14	13	0	0	0	0	0	0	0	0	0
	Nov 24	3	0	0	0	0	0	0	0	0	0
	Dec 4	0	0	0	0	0	0	0	0	0	0
	Dec 19	0	0	0	0	0	0	0	0	0	0
	Total	16	0	0	0	0	0	0	0	0	0
Fourteen Mile Creek	Nov 15	0	0	0	0	0	0	0	0	0	0
	Nov 24	0	0	0	0	0	0	0	0	0	0
	Dec 4	7	0	0	0	0	0	0	0	0	0
	Dec 11	6	1	0	0	1	0	0	0	0	1
	Dec 18	16	1	1	0	3	0	0	0	0	3
	Dec 29	3	4	0	0	5	0	0	0	0	5
	Jan 2	5	1	0	0	1	0	0	0	0	1
	Jan 5	7	0	2	0	6	0	0	0	0	6
	Jan 12	13	5	7	0	15	0	0	0	0	15
	Jan 17	-	1	0	0	1	0	0	0	0	1
	Jan 19	-	0	2	0	14	0	0	0	0	14
	Jan 23	53	1	3	0	4	0	0	0	0	4
	Jan 30	38	11	10	0	29	0	0	0	0	29
	Feb 5	9	0	0	0	31	0	0	0	0	31
	Feb 14	32	0	0	0	11	0	0	0	0	11

Appendix 7a. Summary of live observations and dead counts of coho salmon in Vedder-Chilliwack River tributaries, 1978-79.

Location	Date	Live Count	Dead Recoveries								
			Adipose Present				Adipose Absent				Total Dead
			Male	Female	Jack	Total	Male	Female	Jack	Total	
	Total	-	25	25	0	121	0	0	0	0	121
Frosst Creek	Nov 28	0	1	0	0	1	0	0	0	0	1
	Dec 14	0	0	0	0	0	0	0	0	0	0
	Dec 20	18	0	0	0	0	0	0	0	0	0
	Jan 25	11	2	0	0	2	0	0	0	0	2
	Feb 2	5	3	2	0	8	0	0	0	0	8
	Total	-	6	2	0	11	0	0	0	0	11
Gunther Ditch	Nov 14	0	0	0	0	0	0	0	0	0	0
	Dec 14	0	0	0	0	0	0	0	0	0	0
	Jan 2	0	0	0	0	0	0	0	0	0	0
	Feb 23	0	0	0	0	0	0	0	0	0	0
	Total	-	0	0	0	3	0	0	0	0	3
Hopedale Creek	Dec 29	0	0	0	0	0	2	0	0	2	2
	jan 8	0	0	0	0	1	0	1	0	1	2
	Jan 18	9	0	1	0	1	0	0	1	1	2
	Jan 21 a	-	0	0	0	0	1	0	0	1	1
	Jan 22	12	2	0	0	2	1	0	0	1	3
	Jan 25	15	1	1	0	2	0	0	0	0	2
	Jan 29	2	2	1	0	3	0	0	0	0	3
	Feb 1	5	0	2	0	2	0	0	0	0	2
	Feb 3	-	1	0	0	1	0	0	0	0	1
	Feb 5	42	0	5	0	5	0	2	0	2	7
	Feb 8	45	1	1	0	2	0	1	0	1	3
	Feb 11 a	-	0	1	0	1	0	0	0	0	1
	Feb 15	24	3	5	0	8	1	3	0	4	12
	Feb 19	5	4	5	0	9	1	2	0	3	12
	Total	-	14	22	0	37	6	9	1	19	56
Hopedale Slough	Oct 3	0	0	0	0	0	0	0	0	0	0
	Dec 14	1	0	0	0	0	0	0	0	0	0
	Jan 18	3	0	0	0	0	0	0	0	0	0
	Jan 25	8	0	0	0	0	0	0	0	1	1
	Feb 1	4	0	0	0	0	0	0	0	0	0
	Total	-	0	0	0	0	0	0	0	1	1
Liumchen Creek	Nov 20	0	0	0	0	0	0	0	0	0	0
	Nov 28	1	0	0	0	0	0	0	0	0	0
	Dec 19	0	0	0	0	0	0	0	0	0	0
	Jan 24	0	0	0	0	0	0	0	0	0	0

Appendix 7a. Summary of live observations and dead counts of coho salmon in Vedder-Chilliwack River tributaries, 1978-79.

Location	Date	Live Count	Dead Recoveries								Total Dead
			Adipose Present				Adipose Absent				
			Male	Female	Jack	Total	Male	Female	Jack	Total	
	Jan 29	1	0	0	0	0	0	0	0	0	0
	Total	2	0	0	0	0	0	0	0	0	0
Middle Creek	Nov 2	0	0	0	0	0	0	0	0	0	0
	Nov 20	4	0	0	0	0	0	0	0	0	0
	Nov 27	30	0	0	0	0	0	0	0	0	0
	Dec 4	53	1	0	0	1	0	0	0	0	1
	Dec 12	48	3	3	0	11	0	0	0	0	11
	Dec 19	41	2	3	0	9	0	0	0	0	9
	Jan 17	-	1	0	0	1	0	0	0	0	1
	Jan 24	45	5	7	0	18	0	0	0	0	18
	Jan 31	4	1	2	0	5	0	0	0	0	5
	Feb 6	19	0	0	0	0	0	0	0	0	0
	Total	-	13	15	0	45	0	0	0	0	45
Paleface Creek	Nov 16	1	0	0	0	0	0	0	0	0	0
	Nov 24	0	0	0	0	0	0	0	0	0	0
	Nov 29	5	0	0	0	0	0	0	0	0	0
	Dec 5	1	0	0	0	0	0	0	0	0	0
	Dec 13	0	0	0	0	0	0	0	0	0	0
	Dec 19	5	0	2	0	2	0	0	0	0	2
	Dec 28	0	0	0	0	0	0	0	0	0	0
	Jan 17	1	0	0	0	0	0	0	0	0	0
	Total	-	0	2	0	2	0	0	0	0	2
Post Creek	Nov 15	12	0	0	0	0	0	0	0	0	0
	Nov 20	3	0	0	0	3	0	0	0	0	3
	Nov 27	7	0	0	0	0	0	0	0	0	0
	Dec 12	27	1	0	0	1	0	0	0	0	1
	Dec 18	52	0	0	0	0	0	0	0	0	0
	Dec 23	-	0	0	0	0	0	0	0	0	0
	Dec 29	74	0	0	0	3	0	0	0	0	3
	Jan 5	36	0	0	0	1	0	0	0	0	1
	Jan 12	23	1	1	0	3	0	0	0	0	3
	Jan 23	59	5	1	0	10	0	1	0	1	11
	Jan 30	31	2	3	0	8	0	0	0	0	8
	Feb 14	25	0	1	0	1	1	0	0	1	2
	Total	-	9	6	0	30	1	1	0	2	32
Ryder Creek	Dec 12	0	1	0	0	1	1	0	0	1	2
	Dec 21	0	0	1	0	1	0	0	0	0	1
	Jan 4	0	0	0	0	0	0	0	0	0	0
	Jan 22	45	0	1	0	1	0	0	0	0	1

Appendix 7a. Summary of live observations and dead counts of coho salmon in Vedder-Chilliwack River tributaries, 1978-79.

Location	Date	Live Count	Dead Recoveries								
			Adipose Present				Adipose Absent				Total Dead
			Male	Female	Jack	Total	Male	Female	Jack	Total	
	Jan 23 a	-	0	0	0	0	1	0	0	1	1
	Jan 25	46	1	0	0	1	0	0	0	0	1
	Jan 27 a	-	1	0	0	1	0	0	0	0	1
	Jan 29	46	0	0	0	0	1	0	0	1	1
	Feb 1	56	0	1	0	1	0	0	0	0	1
	Feb 5 a	-	2	0	0	2	0	0	0	0	2
	Feb 6 a	-	3	1	0	4	0	0	0	0	4
	Feb 10 a	-	1	1	0	2	0	1	0	1	3
	Feb 14 a	-	0	0	0	0	1	0	0	1	1
	Feb 15	29	3	0	0	3	0	1	0	1	4
	Feb 16	198	3	1	0	4	6	1	0	7	11
	Feb 19	228	3	10	0	13	0	6	0	6	19
	Feb 23	221	11	7	0	18	4	3	0	7	25
	Total	-	29	23	0	52	14	12	0	26	78
Salwein Creek	Nov 28	1	0	0	0	0	1	0	0	1	1
	Dec 12 a	-	0	0	0	0	1	0	0	1	1
	Dec 14	3	0	1	0	1	0	0	0	0	1
	Dec 21	0	0	2	0	2	0	0	0	0	2
	Dec 29	1	1	0	0	1	0	0	0	0	1
	Jan 5	5	0	1	0	1	1	0	0	1	2
	Jan 15	9	0	1	0	1	0	2	0	2	3
	Jan 22	29	4	2	0	6	3	1	0	4	10
	Jan 25	60	3	3	0	6	1	3	0	4	10
	Jan 29	53	3	8	0	11	1	6	0	7	18
	Feb 1	59	2	5	0	7	2	5	0	7	14
	Feb 5	40	3	10	0	13	5	9	0	14	27
	Feb 7 a	-	0	1	0	1	1	0	0	1	2
	Feb 8	45	11	10	0	21	7	5	0	12	33
	Feb 15	93	7	24	0	31	7	9	0	16	47
	Feb 19	52	10	14	0	24	9	12	0	21	45
	Feb 21	-	-	-	-	-	4	1	0	5	5
	Total	-	44	82	0	126	43	53	0	96	222
Slesse Creek	Nov 24	274	0	0	0	1	0	0	0	0	1
	Dec 7	325	0	0	0	0	0	0	0	0	0
	Dec 13	352	1	0	0	1	0	0	0	0	1
	Jan 25	314	0	0	0	7	0	0	0	0	7
	Jan 26	-	1	1	0	2	0	0	0	0	2
	Total	-	2	1	0	11	0	0	0	0	11
Street Creek	Oct 31	0	0	0	0	0	0	0	0	0	0
	Dec 14	0	0	0	0	0	0	0	0	0	0
	Dec 29	1	0	0	0	0	0	0	0	0	0

Appendix 7a. Summary of live observations and dead counts of coho salmon in Vedder-Chilliwack River tributaries, 1978-79.

Location	Date	Live Count	Dead Recoveries								Total Dead
			Adipose Present				Adipose Absent				
			Male	Female	Jack	Total	Male	Female	Jack	Total	
	Jan 18	30	0	0	0	2	0	0	0	0	2
	Jan 25	39	4	5	0	11	0	1	0	1	12
	Feb 1	19	1	2	0	3	0	3	0	3	6
	Feb 7	33	7	8	0	16	2	0	0	2	18
	Total	-	12	15	0	32	2	4	0	6	38
Sweltzer River	Nov 2	5	0	0	0	0	0	0	0	0	0
	Nov 17	100	0	0	0	0	0	0	0	0	0
	Nov 28	135	0	0	0	0	0	0	0	0	0
	Dec 6	99	0	0	0	2	0	0	0	0	2
	Dec 14	68	1	1	0	3	0	0	0	0	3
	Dec 20	42	2	4	0	6	0	0	0	0	6
	Jan 4	25	2	3	0	5	0	0	0	0	5
	Jan 16	13	2	2	0	5	0	0	0	0	5
	Jan 25	41	2	0	0	4	0	0	0	0	4
	Feb 2	23	0	1	0	2	0	0	0	0	2
	Feb 9	28	1	1	0	2	0	1	0	1	3
	Total	-	10	12	0	29	0	1	0	1	30
Tamihi Creek	Nov 20	0	0	0	0	0	0	0	0	0	0
	Nov 28	0	0	0	0	0	0	0	0	0	0
	Dec 12	0	0	0	0	0	0	0	0	0	0
	Dec 19	0	0	0	0	0	0	0	0	0	0
	Jan 24	8	0	0	0	0	0	0	0	0	0
	Jan 29	8	0	0	0	0	0	0	0	0	0
	Total	-	0	0	0	0	0	0	0	0	0
Upper Chilliwack River	Oct 2 b	233	0	0	0	0	0	0	0	0	0
	Oct 6 b	235	0	0	0	0	0	0	0	0	0
	Oct 14 a	-	0	1	0	1	0	0	0	0	1
	Oct 16 a	-	0	1	0	1	0	0	0	0	1
	Oct 17 b	46	0	0	0	0	0	0	0	0	0
	Oct 18 a	-	0	1	0	1	0	0	0	0	1
	Oct 20 a	-	3	1	0	4	0	0	0	0	4
	Oct 21 a	-	0	1	0	1	0	0	0	0	1
	Oct 30	161	4	2	0	6	0	0	0	0	6
	Nov 16	7	2	0	0	2	0	0	0	0	2
	Nov 29 c	52	0	0	0	0	0	0	0	0	1
	Dec 5	16	0	0	0	0	0	0	0	0	0
	Dec 13 c	3	0	0	0	0	0	0	0	0	1
	Total	-	9	7	0	16	0	0	0	0	18

a. Recovered on fence trap. b. Incomplete survey c. Sex and mark status unknown.

Appendix 7b. Summary of live observations and dead counts of coho salmon in the Vedder-Chilliwack River mainstem, 1978-79.

Location	Date	Live Count	Dead Recoveries								Total Dead
			Adipose Present				Adipose Absent				
			Male	Female	Jack	Total	Male	Female	Jack	Total	
Area 1	Nov 2	1	0	0	0	0	0	0	0	0	0
	Nov 22	1	0	0	0	0	0	0	0	0	0
	Total	-	0	0	0	0	0	0	0	0	0
Area 2	Nov 1	3	0	0	0	1	0	0	0	0	1
	Nov 21	5	0	0	0	1	0	0	0	0	1
	Dec 8	1	0	0	0	0	0	0	0	0	0
	Dec 20	6	0	0	0	1	0	0	0	0	1
	Total	-	0	0	0	3	0	0	0	0	3
Area 3	Nov 1	16	0	0	0	1	0	0	0	0	1
	Nov 21	4	0	0	0	0	0	0	0	0	0
	Dec 6	12	0	0	0	1	0	0	0	0	1
	Dec 20	36	0	0	0	1	0	0	0	0	1
	Total	-	0	0	0	3	0	0	0	0	3
Area 4	Nov 1	136	0	0	0	0	0	0	0	0	0
	Nov 21	24	0	0	0	0	0	0	0	0	0
	Dec 7	76	0	0	0	2	0	0	0	0	2
	Dec 18	22	0	0	0	0	0	0	0	0	0
	Total	-	0	0	0	2	0	0	0	0	2
Area 5	Nov 6	22	0	0	0	1	0	0	0	0	1
	Nov 22	7	0	0	0	0	0	0	0	0	0
	Dec 20	8	0	0	0	2	0	0	0	0	2
	Total	-	0	0	0	3	0	0	0	0	3
Area 6	Dec 21	124	0	0	0	2	0	0	0	0	2
	Jan 18	161	0	0	0	0	0	0	0	0	0
	Total	-	0	0	0	2	0	0	0	0	2
Area 7	Jan 17	200	0	0	0	0	0	0	0	0	0
	Jan 23	20	0	0	0	0	0	0	0	0	0
	Total	-	0	0	0	0	0	0	0	0	0
Area 8	Oct 23	83	0	0	0	0	0	0	0	0	0
	Nov 17	45	0	0	0	1	0	0	0	0	1
	Dec 7	979	0	0	0	4	0	0	0	0	4
	Dec 15	1147	0	0	0	9	0	0	0	1	10
	Jan 17	115	0	0	0	0	0	0	0	0	0

Appendix 7b. Summary of live observations and dead counts of coho salmon in the Vedder-Chilliwack River mainstem, 1978-79.

			Dead Recoveries								
			Adipose Present				Adipose Absent				
Location	Date	Live Count	Male	Female	Jack	Total	Male	Female	Jack	Total	Total Dead
	Feb 13	35	0	0	0	13	0	0	0	0	13
	Total	-	0	0	0	27	0	0	0	1	28
Area 9	Oct 23	95	0	0	0	0	0	0	0	0	0
	Nov 3	124	0	0	0	0	0	0	0	0	0
	Nov 17	177	0	0	0	0	0	0	0	0	0
	Dec 6	426	0	0	0	0	0	0	0	0	0
	Dec 15	286	0	0	0	0	0	0	0	0	0
	Jan 8	101	0	0	0	3	0	0	0	0	3
	Feb 13	33	0	0	0	10	0	0	0	1	11
	Total	-	0	0	0	13	0	0	0	1	14
Grand Total		-	0	0	0	53	0	0	0	2	55

Area 1 - Mouth to B.C. Hydro railroad bridge.
Area 2 - RR bridge to Barrett Creek.
Area 3 - Barret Creek to Vedder Crossing.
Area 4 - Vedder Crossing to Liumchen Creek.
Area 5 - Liumchen Creek to Tamihi Creek.
Area 6 - Tamihi Creek to Slesse Creek.
Area 7 - Slesse Creek to Chipmunk Creek.
Area 8 - Chipmunk Creek to Center Creek.
Area 9 - Center Cr. to Chilliwack Lake outlet.

Appendix 8. Summary of live observations and dead counts of coho salmon in Vedder-Chilliwack River tributaries, 1979-80.

Location	Date	Live Count	Dead Recoveries								Total Dead
			Adipose Present				Adipose Absent				
			Male	Female	Jack	Total	Male	Female	Jack	Total	
Barrett Creek	Dec 12	4	0	0	0	0	0	0	0	0	0
	Dec 27	27	0	1	1	4	3	3	0	6	10
	Jan 2	14	1	2	0	3	1	6	0	7	10
	Jan 7	10	0	3	0	3	4	5	0	10	13
	Jan 15	32	4	2	0	6	7	7	0	14	20
	Feb 8	1	-	-	-	-	-	-	-	-	7
	Total	-	5	8	1	16	15	21	0	37	60
Borden Creek	Nov 15	0	0	0	0	0	0	0	0	0	0
	Nov 21	0	0	0	0	0	0	0	0	0	0
	Dec 6	29	0	0	0	0	0	0	0	0	0
	Dec 31	25	2	3	0	5	0	0	0	0	5
	Jan 9	4	2	2	0	4	1	0	0	1	5
	Jan 14	22	1	4	0	5	1	1	0	2	7
	Total	-	5	9	0	14	2	1	0	3	17
Depot Creek	Nov 16	1	0	0	0	0	0	0	0	0	0
	Nov 22	5	0	0	0	0	0	0	0	0	0
	Dec 3	14	0	0	0	0	0	0	0	0	0
	Dec 11	18	0	1	0	1	0	0	0	0	1
	Total	-	0	1	0	1	0	0	0	0	1
Fifteen Mile Creek	Nov 15	0	0	0	0	0	0	0	0	0	0
	Dec 3	0	0	0	0	0	0	0	0	0	0
	Dec 14	20	0	0	0	0	0	0	0	0	0
	Dec 20	62	2	3	0	5	0	1	0	1	6
	Dec 31	13	0	9	8	20	2	2	0	4	24
	Jan 3	12	2	4	0	7	0	0	0	0	7
	Jan 9	3	2	1	0	3	0	0	0	0	3
	Jan 14	3	2	0	0	4	0	4	0	4	8
	Total	-	8	17	8	39	2	7	0	9	48
Foley Creek	Nov 15	0	0	0	0	0	0	0	0	0	0
Forsyte Side Channel	Nov 14	0	0	0	0	0	0	0	0	0	0
	Nov 22	0	0	0	0	0	0	0	0	0	0
	Dec 7	6	0	0	0	0	0	0	0	0	0
	Dec 14	20	0	0	0	0	0	0	0	0	0
	Jan 3	21	6	4	0	11	0	1	0	1	12
	Jan 8	2	7	3	0	10	0	0	0	0	10
	Jan 14	7	2	4	0	6	0	0	0	0	6
	Total	-	15	11	0	27	0	1	0	1	28

Appendix 8. Summary of live observations and dead counts of coho salmon in Vedder-Chilliwack River tributaries, 1979-80.

Location	Date	Live Count	Dead Recoveries								
			Adipose Present				Adipose Absent				Total Dead
			Male	Female	Jack	Total	Male	Female	Jack	Total	
Fourteen Mile Creek	Nov 15	0	0	0	0	0	0	0	0	0	0
	Dec 7	39	0	1	0	1	0	0	0	0	1
	Dec 14	40	0	0	0	0	0	0	0	0	0
	Dec 20	50	5	3	0	9	1	0	0	1	10
	Jan 2	4	13	19	0	43	0	0	0	0	43
	Jan 20	1	1	3	0	4	0	0	0	0	4
	Jan 15	0	0	2	0	2	0	0	0	0	2
	Total	-	19	28	0	59	1	0	0	1	60
Frosst Creek	Nov 21	1	0	0	0	0	0	0	0	0	0
Gunther Ditch	Dec 3	0	0	0	0	0	0	0	0	0	0
	Jan 16	0	1	2	0	3	0	3	0	3	6
	Total	0	1	2	0	3	0	3	0	3	6
Hopedale Creek	Dec 10	7	0	0	0	0	0	0	0	0	0
	Dec 28	83	10	13	0	24	11	36	0	47	71
	Jan 3	-	4	5	0	9	5	10	0	20	29
	Jan 4*	0	0	2	0	8	2	2	0	4	12
	Jan 10	42	0	0	0	5	0	0	0	17	22
	Jan 16	50	0	0	0	7	0	0	0	26	33
	Total	-	14	20	0	53	18	48	0	114	167
Middle Creek	Nov 22	12	0	0	0	0	0	0	0	0	0
	Dec 12	77	0	0	0	0	0	0	0	0	0
	Jan 4	22	7	3	0	11	0	0	0	0	11
	Jan 15	12	3	1	0	4	0	0	0	0	4
	Total	-	10	4	0	15	0	0	0	0	15
Paleface Creek	Nov 16	6	0	0	0	0	0	0	0	0	0
	Nov 22	7	0	0	0	0	0	0	0	0	0
	Dec 3	5	0	0	0	0	0	0	0	0	0
	Dec 11	11	0	0	0	0	0	0	0	0	0
	Total	-	0	0	0	0	0	0	0	0	0
Post Creek	Nov 14	2	0	0	0	0	0	0	0	0	0
	Nov 22	29	1	0	0	1	0	0	0	0	1
	Dec 3	24	1	0	0	1	0	0	0	0	1
	Dec 11	58	2	4	0	6	0	0	0	0	6
	Dec 24	138	14	11	1	27	0	2	0	2	29
	Jan 3	36	15	22	0	55	2	4	0	7	62
	Jan 8	-	6	8	0	14	0	1	0	1	15

Appendix 8. Summary of live observations and dead counts of coho salmon in Vedder-Chilliwack River tributaries, 1979-80.

Location	Date	Live Count	Dead Recoveries								
			Adipose Present				Adipose Absent				Total Dead
			Male	Female	Jack	Total	Male	Female	Jack	Total	
	Jan 14	7	0	1	0	9	0	0	0	2	11
	Total	-	39	46	1	113	2	7	0	12	125
Ryder Creek	Dec 12	22	0	0	0	0	1	0	0	1	1
	Dec 31	35	3	2	0	5	5	1	0	6	11
	Jan 4	0	1	0	0	1	0	2	0	2	3
	Jan 7	4	2	3	0	5	5	9	0	14	19
	Jan 15	12	1	4	1	6	5	5	0	10	16
	Feb 8 a	64	0	0	0	0	0	0	0	0	0
	Total	-	7	9	1	17	16	17	0	33	50
Salvein Creek	Dec 12	0	0	0	0	0	2	0	0	2	2
	Dec 17	0	0	0	0	0	2	0	0	2	2
	Dec 20 a	57	0	0	0	0	1	2	0	3	3
	Dec 27	38	0	2	0	3	11	13	0	25	28
	Dec 31	-	1	0	0	1	3	4	0	7	8
	Jan 4 a	29	0	0	0	1	16	9	0	26	27
	Jan 8	-	0	0	0	0	0	1	0	1	1
	Jan 10	12	2	1	0	3	3	11	0	16	19
	Jan 16	70	0	3	1	5	6	6	0	22	27
	Feb 8 a	7	0	0	0	6	0	0	0	3	9
	Total	-	3	6	1	19	44	46	0	107	126
Sleese Creek	Nov 15	189	0	0	0	0	0	0	0	0	0
	Jan 11	40	12	8	0	20	0	1	0	1	21
	Total	-	12	8	0	20	0	1	0	1	21
Street Creek	Dec 10	2	0	0	0	0	0	0	0	0	0
	Dec 28	2	0	2	0	2	0	2	0	2	4
	Jan 4	3	1	0	0	1	2	2	0	4	5
	Jan 10	0	0	1	0	1	0	0	0	0	1
	Jan 16	13	0	0	0	0	0	0	0	0	0
	Feb 8	5	0	0	0	0	0	0	0	0	0
	Total	-	1	3	0	4	2	4	0	6	10
Tamihi Creek	Jan 10	1	0	0	0	0	0	0	0	0	0
Upper Chilliwack River	Sep 14	40	0	0	0	0	0	0	0	0	0
	Sep 24	15	0	0	0	0	0	0	0	0	0
	Sep 25	25	0	0	0	0	0	0	0	0	0
	Oct 9	100	0	0	0	0	0	0	0	0	0
	Oct 10	50	0	0	0	0	0	0	0	0	0

Appendix 8. Summary of live observations and dead counts of coho salmon in Vedder-Chilliwack River tributaries, 1979-80.

Location	Date	Live Count	Dead Recoveries								Total Dead
			Adipose Present				Adipose Absent				
			Male	Female	Jack	Total	Male	Female	Jack	Total	
	Oct 15	-	1	2	0	3	0	0	0	0	3
	Oct 16	-	1	0	0	1	0	0	0	0	1
	Oct 17	-	0	0	0	0	0	0	0	0	0
	Oct 18	-	1	3	0	4	0	1	0	1	5
	Oct 19	400	0	0	0	0	0	0	0	0	0
	Oct 20 a	325	0	2	0	2	1	0	0	1	3
	Oct 21	-	2	2	0	4	0	0	0	0	4
	Oct 22	-	0	2	0	2	1	0	0	1	3
	Oct 26 b	-	0	2	0	2	0	0	0	0	2
	Oct 27 b	-	0	2	0	2	0	0	0	0	2
	Nov 6	-	0	0	0	0	0	0	0	0	0
	Nov 8	242	0	0	0	0	0	0	0	0	0
	Nov 16	139	0	0	0	0	0	0	0	0	0
	Total	-	5	15	0	20	2	1	0	3	23

a. Incomplete survey
b. Recovered on fence

Appendix 9. Summary of Vedder-Chilliwack River system coho adult escapements and methods used in their derivation.

Year	Location	Estimated spawner residence (Fish-days)	Elapsed time between peak live and dead counts (Days)	Total escapement		Adipose clips		
				Estimation method a	Estimate	Sample size	Mark incidence	Escapement estimate
1977-78	Barrett Creek	2,063	7	2	496	157	0.17	85
	Borden Creek	1,718	17	2 b	413	12	0.08	34
	Fifteen Mile Creek	3,884	35	3	361	128	0.07	25
	Fourteen Mile Creek	-	0	3 c	51	18	0.06	3
	Hopedale Creek	5,337	12	2	1,283	343	0.33	426
	Hopedale Slough	924	16	3	76	26	0.27	20
	Nesakwatch Creek	824	40	3	54	19	0.05	3
	Post Creek	5,832	33	3	203	72	0.03	6
	Ryder Creek	2,383	5	2	573	62	0.23	129
	Salwein Creek	2,752	5	1	583	583	0.16	94
	Street Creek	1,837	0	2	442	134	0.16	69
	Vedder-Chilliwack Mainstem	-	-	4	6,000	343	0.03	192
1978-79	Barrett Creek	1,736	13	2	417	87	0.13	53
	Borden Creek	1,422	4	2	342	23	0.04	15
	Fifteen Mile Creek	945	4	2	227	102	0.04	9
	Foley Creek	6,756	38	3	28	10	0.10	3
	Hopedale Creek	540	7	1	127	127	0.39	50
	Hopedale Slough	-	0	-	-	1	1.00	1
	Post Creek	3,193	25	3	90	32	0.06	6
	Ryder Creek	3,137	4	2	754	315	0.39	297
	Salwein Creek	2,518	0	1	719	687	0.52	375
	Street Creek	1,108	7	2	266	38	0.16	42
	Sweltzer River	5,828	33	3	85	30	0.03	3
	Upper Chilliwack River	-	-	4	3,000	139	0.09	259
	Vedder-Chilliwack River	-	-	4	5,000	55	0.04	182
1979-80	Barrett Creek	879	0	2 d	211	59	0.63	132
	Borden Creek	1,342	39	3	48	17	0.18	8
	Fifteen Mile Creek	784	11	2	188	40	0.23	42
	Forsyte Side Channel	801	0	3	79	28	0.04	3
	Fourteen Mile Creek	1,220	13	2	293	60	0.02	5
	Gunther Ditch	-	-	3	17	6	0.50	8
	Hopedale Creek	2,398	0	2 d	576	167	0.68	393
	Post Creek	3,104	10	2	746	124	0.10	72
	Ryder Creek	2,097	32	3	138	49	0.67	93
	Salwein Creek	1,776	7	2	427	274	0.91	386
	Slesse Creek	9,249	57	3	59	21	0.05	3
	Street Creek	383	12	2	92	10	0.60	55
	Upper Chilliwack River	-	-	4	3,300	269	0.05	158
	Vedder-Chilliwack River	-	-	4	9,000	0	- e	312

Appendix 9. Summary of Vedder-Chilliwack River system coho adult escapements and methods used in their derivation.

Year	Location	Estimated spawner residency (Fish-days)	Elapsed time between peak live and dead counts (Days)	Total escapement		Adipose clips		
				Estimation method a	Estimate	Sample size	Mark incidence	Escapement estimate
1980-81	Upper Chilliwack River	-	-	4	1,500	126	0.05	71
1981-82	Upper Chilliwack River	-	-	4	1,500	139	0.07	108

a. Estimation methods (see text): 1. Fence count.
2. Spawner curve.
3. Recovery rate.
4. Subjective.

b. Method 2 used because of unusually low carcass recovery level.

c. Method 3 used because of unusually low live observations.

d. Method 2 used because survey terminated prior to peak die-off; carcass recovery levels unreliable.

e. Average Vedder-Chilliwack River mark incidence, 1977-78 and 1978-79.

Appendix 10a. Observed and estimated coho adult escapement by CWT code in the Vedder-Chilliwack River system, 1977-78.

Location	Estimated total marked escapement	Number of marks recovered	Observed codes			Escapement	
			02 15 13	No tag	Tag lost	02 15 13	No tag
Barrett Creek	85	27	16	6	5	66	19
Borden Creek	34	1	0	1	0	30	4 a
Fifteen Mile Creek	25	9	3	3	3	17	8
Fourteen Mile Creek	3	1	1	0	0	3	0
Hopedale Creek	426	114	96	7	11	400	26
Hopedale Slough	20	7	5	2	0	14	6
Nesakwatch Creek	3	1	0	1	0	0	3
Post Creek	6	2	0	0	2	5	1 a
Ryder Creek	129	14	8	1	5	120	9
Salwein Creek	94	12	12	0	0	94	0
Street Creek	69	21	17	2	2	62	7
Vedder-Chilliwack River	192	11	2	2	7	170	22 a
Total	1086	220	160	25	35	982	104

a. Due to inadequate sample size, escapement by code estimated from annual total.

Appendix 10b. Observed and estimated coho adult escapement by CWT code in the Vedder-Chilliwack River system, 1978-79.

Location	Estimated total marked escapement	Number of marks recovered	Observed codes				Escapement		
			02 04 13	02 15 11	No tag	Tag lost	02 04 13	02 15 11	No tag
Barrett Creek	53	11	8	0	0	3	53	0	0
Borden Creek	15	1	0	0	1	0	14	0	1 a
Fifteen Mile Creek	9	4	2	0	0	2	9	0	0
Foley Creek	3	1	1	0	0	0	3	0	0
Hopedale Creek	50	19	16	0	1	2	47	0	3
Hopedale Slough	1	1	0	0	0	1	1	0	0 a
Post Creek	6	2	2	0	0	0	6	0	0
Ryder Creek	297	26	22	0	1	3	286	0	11
Salwein Creek	375	96	87	0	4	5	359	0	16
Street Creek	42	6	5	0	0	1	42	0	0
Sweltzer River	3	1	1	0	0	0	3	0	0
Upper Chilliwack River	259	0	0	0	0	0	96	143	20 b
Vedder-Chilliwack River	182	2	1	0	1	0	173	0	9 a
Total	1295	170	145	0	8	17	1093	143	59

a. Due to inadequate sample size, escapement by code estimated from annual total.

b: CWT loss rate based on 1977-79 Vedder-Chilliwack average; escapement by code based on ratio of Vedder-Chilliwack to upper Chilliwack River CWTs observed in 1979-80.

Appendix 10c. Observed and estimated coho adult escapement by CWT code in the Vedder-Chilliwack River system, 1979-80.

Location	Estimated total marked escapement	Number of marks recovered	Observed codes				Escapement		
			02 21 24	02 21 20	No tag	Tag lost	02 21 24	02 21 20	No tag
Barrett Creek	132	37	33	0	2	2	125	0	7
Borden Creek	8	3	3	0	0	0	8	0	0
Fifteen Mile Creek	42	9	7	0	1	1	37	0	5
Forsyte Side Channel	3	1	1	0	0	0	3	0	0
Fourteen Mile Creek	5	1	0	0	0	1	4	0	1 a
Gunther Ditch	8	3	2	0	1	0	5	0	3
Hopedale Creek	393	114	56	0	9	49	362	0	31
Post Creek	72	12	7	0	1	4	66	0	6
Ryder Creek	93	33	28	0	3	2	85	0	8
Salwein Creek	386	107	80	0	8	19	357	0	29
Slesse Creek	3	1	1	0	0	0	3	0	0
Street Creek	55	6	6	0	0	0	55	0	0
Upper Chilliwack River	158	13	4	6	2	1	58	87	13 b
Vedder-Chilliwack River	312	0	0	0	0	0	288	0	24 a
Total	1670	340	228	6	27	79	1456	87	127

a. Due to inadequate sample size, escapement by code estimated from 1979-80 tributary total.
b. Due to inadeqate sample size, CWT loss rate calculated from 1977-79 Vedder-Chilliwack average.

Appendix 10d. Observed and estimated coho adult escapement by CWT code in the Vedder-Chilliwack River system, 1980-81.

Location	Estimated total marked escapement	Number of marks recovered	Observed codes			Escapement	
			02 21 30	No tag	Tag lost	02 21 30	No tag
Upper Chilliwack River	71	8	5	3	0	65	6 a

a. Due to inadeqate sample size, CWT loss rate calculated from 1977-79 Vedder-Chilliwack average.

Appendix 11a. Sex and age composition and mean postorbital-hypural plate lengths of coho salmon recovered on the Vedder-Chilliwack River and tributary spawning grounds.

Year	Age	Sex	Number Sampled	Rel. Percent	Mean Length (cm)	s
1977-78	4/3	Male	5	1.2	44.8	9.59
		Female	8	2.0	46.9	2.33
	3/2	Male	166	41.3	46.8	4.05
		Female	222	55.2	47.0	3.44
	2/2	Male	1	0.2	26.1	-
	Total	Male	209	42.4	46.4	4.78
		Female	284	57.6	47.0	3.34
1978-79	4/3	Male	8	1.6	47.0	3.18
		Female	12	2.3	46.6	3.00
	3/2	Male	209	40.5	46.6	4.61
		Female	285	55.2	46.4	3.31
	2/2	Male	2	0.4	27.4	4.54
	Total	Male	240	42.3	46.3	4.87
		Female	327	57.7	46.4	3.22
1979-80	4/3	Male	9	1.6	45.4	4.98
		Female	21	3.7	48.0	4.93
	3/2	Male	228	40.1	46.0	4.25
		Female	306	53.9	46.7	3.61
	2/2	Male	4	0.7	25.7	9.54
	Total	Male	251	42.7	45.7	5.00
		Female	337	57.3	46.8	3.74

1978 NF-POHL Regressions:

- Male: NF (cm) = 0.99 POHL (cm) + 11.88; r = 0.85; n = 41
- Female: NF (cm) = 1.05 POHL (cm) + 9.47; r = 0.86; n = 55

Appendix 11b. Sex and age composition and mean nose-fork lengths of coho salmon recovered at the upper Chilliwack River enumeration fence.

Year	Age	Sex	Number sampled	Rel. percent	Mean length (cm)	s
1978-79	4/3	Male	2	2.3	68.1	4.10
		Female	6	6.9	59.1	6.23
	3/2	Male	48	55.2	62.8	5.74
		Female	30	34.5	59.9	4.47
	3/3	Male	1	1.1	36.3	-
	Total	Male	55	56.1	62.2	6.76
		Female	43	43.9	59.6	4.36
1979-80	4/3	Male	1	0.8	56.9	-
		Female	3	2.4	55.2	2.76
	3/2	Male	59	46.8	60.9	5.77
		Female	63	50.0	61.8	5.48
	Total	Male	62	48.4	60.6	5.67
		Female	66	51.6	61.1	5.85
1980-81	4/3	Male	0	0.0	-	-
		Female	11	11.6	58.7	4.47
	3/2	Male	26	27.4	62.9	7.24
		Female	58	61.1	63.5	6.42
	Total	Male	31	31.0	63.1	6.81
		Female	69	69.0	62.7	6.37

Appendix 12a. Summary of live observations and dead counts of coho adults in the Salmon River system, 1979-80.

	Coghlan Creek					Salmon River				
			Dead recovery					Dead recovery		
Date	Location a	Live count	Adipose present	Adipose absent	Total	Location b	Live count	Adipose present	Adipose absent	Total
Nov 6	C1-4	43	11	3	14	S1-3	156	21	2 c	23
Nov 20	C1-4	59	12	5	17	S1-4	153	29	1	30
Nov 27	C1-4	295	11	4	15	S1-4	299	33	1	34
Dec 7	C1-4	991	32	10	42	S1-4	654	41	0	41
Dec 27	C1-4	134	71	11	82	S1-4	75	70	3	73
Jan 4	C1-4	68	56	9	65	S1-4	11	29	1	30
Jan 21	C1-4	2	35	4	39	S1-4	0	6	0	6
Feb 8	C1-4	1	9	0	9	S1-4	0	5	0	5
Total	-	-	237	46	283	-	-	234	8	242

a. C1 - Salmon River to Highway 1.
C2 - Highway 1 to 248th Street.
C3 - 248th Street to 64th Avenue.
C4 - 64th Avenue to 256th Street.
C5 - Above 256th Street.

b. S1 - Highway 1 to Coghlan Creek.
S2 - Coghlan Creek to 64th Avenue.
S3 - 64th Avenue to 56th Avenue.
S4 - 56th Avenue to 248th Street.
S5 - Above 248th Street.

c. Includes a 1976 Brood Dungeness Hatchery Coho (17 63 21).

Appendix 12b. Summary of live observations and dead counts of coho adults in the Salmon River system, 1980-81.

	Coghlan Creek					Salmon River					
			Dead recovery						Dead recovery		
Date	Location a	Live count	Adipose present	Adipose absent	Total	Date	Location a	Live count	Adipose present	Adipose absent	Total
Nov 12	C1-4	162	8	6	14	Nov 14	S1-4	306	21	22	43
Nov 20	C1-5	164	12	3	15	Nov 25	S1-4	104	20	16	36
Dec 4	C1-4	244	9	3	12	Dec 4	S1-4	25	15	3	18
Dec 15	C1	25	29	14	43	Dec 17	S1-4	171	62	29	91
Dec 16	C2-5	103	41	12	53	Jan 2	S1-4	13	23	7	30
Dec 22	C5	1	1	2	3	Jan 7	S1-4	7	24	2	26
Jan 2	C3-5	9	22	8	30	Jan 21	S1-4	1	6	1	7
Jan 5	C1-2	21	76	9	85						
Jan 12	C1-5	0	29	4	33						
Jan 21	C5	0	0	0	0						
Total	-	-	227	61	288	-	-	-	171	80	251

a. See footnote, Appendix 12a.

Appendix 12c. Summary of live observations and dead counts of coho adults in the Salmon River system, 1981-82.

Coghlan Creek						Salmon River					
			Dead recovery						Dead recovery		
Date	Location a	Live count	Adipose present	Adipose absent	Total	Date	Location a	Live count	Adipose present	Adipose absent	Total
Nov 3	C1-5	280	2	0	2	Nov 3	S1-5	119	2	5	7
Nov 10	C1-5	157	14	12	26	Nov 10	S1-5	82	14	6	20
Dec 8	C1-5	33	30	4	34	Dec 8	S1-5	25	18	11	29
Dec 16	C1-4	15	20	1	21	Dec 17	S3-4	0	4	2	6
Jan 5	C1-5	0	0	0	0	Dec 24	S1	6	0	0	0
						Feb 3	S1-5	0	0	0	0
Total	-	-	66	17	83	-	-	-	38	24	62

a. See footnote, Appendix 12a.

Appendix 12d. Summary of live observations and dead counts of coho adults in five small streams near the Salmon River, 1980-81.

			Dead recovery			Escapement	
	Date	Live count	Adipose present	Adipose absent	Total	Total a	Adipose absent
Nathan Creek	Nov 26	222	54	0	54	-	-
	Dec 18	97	59	0	59	-	-
	Jan 8	1	52	1	53	-	-
	Total	-	165	1	166	375	2
Silverdale Creek	Dec 5	14	17	0	17	-	-
	Dec 19	37	57	0	57	-	-
	Jan 9	3	25	0	25	-	-
	Total	-	99	0	99	200	0
West Creek	Nov 26	83	30	0	30	-	-
	Dec 18	59	33	0	33	-	-
	Jan 8	1	28	0	28	-	-
	Total	-	91	0	91	150	0
Whonock Creek	Dec 5	14	16	0	16	-	-
	Dec 22	1	7	0	7	-	-
	Jan 9	1	11	0	11	-	-
	Total	-	34	0	34	500	0
Yorkson Creek	Dec 5	11	3	0	3	-	-
	Dec 19	5	12	1	13	-	-
	Total	-	15	1	16	200	13

a. From Farwell et al. (1987).

Appendix 13. Daily fence trap catches of coho salmon in the Salmon River, 1981 (from Slaney and Milko MS 1982).

Date	Male	Female	Jack	Total		Adipose Absent	
				Total	Cum.	Total	Cum.
02-Oct	1	1	0	2	2	0	0
03-Oct	0	0	1	1	3	0	0
04-Oct	1	0	0	1	4	0	0
05-Oct	0	0	3	3	7	0	0
06-Oct	0	0	0	0	7	0	0
07-Oct	2	1	4	7	14	1	1
08-Oct	0	0	0	0	14	0	1
09-Oct	0	0	0	0	14	0	1
10-Oct	1	0	2	3	17	0	1
11-Oct	0	0	3	3	20	0	1
12-Oct	3	2	2	7	27	3	4
13-Oct	0	1	2	3	30	1	5
14-Oct	0	0	0	0	30	0	5
15-Oct	0	1	1	2	32	1	6
16-Oct	0	0	1	1	33	0	6
17-Oct	1	0	1	2	35	0	6
18-Oct	1	0	0	1	36	0	6
19-Oct	0	0	0	0	36	0	6
20-Oct	0	0	0	0	36	0	6
21-Oct	0	0	0	0	36	0	6
22-Oct	0	0	0	0	36	0	6
23-Oct	0	0	0	0	36	0	6
24-Oct	0	0	0	0	36	0	6
25-Oct	2	0	5	7	43	0	6
26-Oct	8	3	12	23	66	4	10
27-Oct a	23	19	7	49	115	10	20
28-Oct	124	74	50	248	363	62	82
29-Oct a	73	49	66	188	551	51	133
30-Oct	25	16	19	60	611	12	145
31-Oct	36	19	25	80	691	19	164
01-Nov a	15	7	7	29	720	9	173
02-Nov a	0	0	0	0	720	0	173
03-Nov	8	6	17	31	751	3	176
04-Nov	2	1	1	4	755	0	176
05-Nov	0	2	2	4	759	1	177
06-Nov	0	0	6	6	765	0	177
07-Nov	2	1	4	7	772	0	177
08-Nov	1	4	7	12	784	2	179
09-Nov	7	2	3	12	796	1	180
10-Nov	1	5	0	6	802	1	181
11-Nov	1	5	2	8	810	1	182
12-Nov	6	10	4	20	830	2	184
13-Nov	4	3	3	10	840	0	184
14-Nov	0	2	0	2	842	0	184
15-Nov	0	0	0	0	842	0	184
16-Nov	0	0	0	0	842	0	184
17-Nov	0	0	0	0	842	0	184
18-Nov	0	0	0	0	842	0	184
19-Nov	3	3	1	7	849	0	184

Appendix 13. Daily fence trap catches of coho salmon in the Salmon River, 1981 (from Slaney and Milko MS 1982).

				Total		Adipose Absent	
Date	Male	Female	Jack	Total	Cum.	Total	Cum.
20-Nov	0	0	0	0	849	0	184
21-Nov	0	0	0	0	849	0	184
22-Nov	5	2	2	9	858	1	185
23-Nov	0	0	0	0	858	0	185
24-Nov	0	2	1	3	861	0	185
25-Nov	0	0	0	0	861	0	185
26-Nov	0	1	0	1	862	0	185
27-Nov	0	0	0	0	862	0	185
28-Nov	0	0	0	0	862	0	185
29-Nov	0	0	0	0	862	0	185
30-Nov	1	0	0	1	863	0	185
01-Dec	2	3	0	5	868	0	185
02-Dec a	0	2	0	2	870	0	185
03-Dec a	0	0	0	0	870	0	185
04-Dec a	0	0	0	0	870	0	185
05-Dec	0	0	0	0	870	0	185
06-Dec	0	0	0	0	870	0	185
07-Dec	0	0	0	0	870	0	185
08-Dec	0	0	0	0	870	0	185
09-Dec	0	0	0	0	870	0	185
10-Dec	0	0	0	0	870	0	185
11-Dec	1	1	0	2	872	0	185
12-Dec	0	0	0	0	872	0	185
13-Dec	0	0	0	0	872	0	185
14-Dec	0	0	0	0	872	0	185
15-Dec	0	0	0	0	872	0	185
16-Dec	0	0	0	0	872	0	185
Total	360	248	264	872	872	185	185

a. Fence out due to high water.

Appendix 14. Estimated escapement of coho adults and adipose clipped coho adults to the Salmon River system.

Year	Location	Estimated spawner residency (Spawner-days)	Adult escapement estimate	Adipose clips		
				Sample size	Mark incidence	Escapement estimate
1979-80	Coghlan Creek	21,510	5,171	283	0.16	843
	Salmon River	21,195	5,095	241	0.03	148
	Total	42,705	10,266	524	-	991
1980-81	Coghlan Creek	12,059	2,899	287	0.21	606
	Salmon River	20,175	4,850	249	0.31	1,518
	Total	32,234	7,749	536	-	2,124
1981-82	Coghlan Creek	7,223	1,736	83	0.21	356
	Salmon River	4,499	1,081	62	0.39	419
	Total	11,722	2,818	608 a	0.30 a	857

a. Enumeration fence sample.

Appendix 15a. Observed and estimated coho adult escapement by CWT code in the Salmon River system, 1979-80.

Location	Estimated total adipose clipped escapement	Number of adipose clips recovered	Observed codes: 02 16 52	Observed codes: No tag	Observed codes: Tag lost	Escapement: 02 16 52	Escapement: No tag
Coghlan Creek	843	46	34	4	8	770	73
Salmon River	148	7	3	2	2	106	42
Total	991	53	37	6	10	879 a	112 a

a. Calculated from pooled sample due to inadequate sample size in Salmon River.

Appendix 15b. Observed and estimated coho adult escapement by CWT code in the Salmon River system, 1980-81.

Location	Estimated total adipose clipped escapement	Number of adipose clips recovered	Observed codes: 02 16 59	Observed codes: 02 18 23	Observed codes: No tag	Observed codes: Tag lost	Escapement a: 02 16 59b	Escapement a: No tag b
Coghlan Creek	606	61	41	1	19	0	547	59
Salmon River	1518	80	65	2	7	6	1371	147
Total	2124	141	-	-	-	-	1918	206

a. Code 02 18 23 return not estimated because precocious male escapement unknown.
b. CWT loss rate ("No Tag") adjusted to 9.7% to correct carcass condition bias (see text).

Appendix 15c. Observed and estimated coho adult escapement by CWT code in the Salmon River system, 1981-82.

Location	Estimated total adipose clipped escapement	Number of adipose clips recovered	Observed codes: 02 18 23	Observed codes: No tag	Observed codes: Tag lost	Escapement: 02 18 23	Escapement: No tag
Coghlan Creek	356	17	12	1	4	335	21
Salmon River	419	24	13	2	9	384	35
Total a	857	41	25	3	13	794	63

a. Total adipose clip escapement based on enumeration fence sample.

Appendix 16. Incidence of CWT loss by carcass condition and eye status in the Salmon River system.

Year	Group	Sample size	CWT absent	CWT loss (%)
1979-80	Condition 1	40	4	10.0
	Condition 2	0	0	-
	Condition 3	4	2	50.0
	Condition 4	0	0	-
	Eyes present	43	6	14.0
	Eyes absent	1	0	0.0
1980-81	Condition 1	40	3	7.5
	Condition 2	22	3	13.6
	Condition 3	63	16	25.4
	Condition 4	12	4	33.3
	Eyes present	110	19	17.3
	Eyes absent	27	7	25.9
1981-82	Condition 1	5	0	0.0
	Condition 2	16	0	0.0
	Condition 3	7	3	42.9
	Condition 4	1	0	0.0
	Eyes present	21	2	9.5
	Eyes absent	8	1	12.5

Appendix 17a. Sex and age composition and mean postorbital-hypural plate lengths of coho salmon recovered on the Salmon River spawning grounds, 1979-81.

			Coghlan Creek				Salmon River			
Year	Age	Sex	Number sampled	Rel. percent	Mean length (cm)	s	Number sampled	Rel. percent	Mean length (cm)	s
1979-80	3/2	Male	52	53.6	43.1	4.84	45	56.3	43.0	5.51
		Female	44	45.4	46.4	3.46	32	40.0	46.3	3.03
	2/2	Male	1	1.0	26.8	-	3	3.8	26.8	0.86
	Total	Male	66	53.7	41.2	6.55	66	55.0	42.3	5.43
		Female	57	46.3	46.2	4.46	54	45.0	46.1	3.03
1980-81	4/3	Male	8	13.1	43.5	5.61	5	6.5	39.8	5.57
		Female	8	13.1	43.7	4.91	3	3.9	46.8	4.56
	3/2	Male	27	44.3	43.9	4.76	32	41.6	43.9	6.15
		Female	16	26.2	45.0	3.34	33	42.9	47.4	4.39
	3/3	Male	0	-	-	-	2	2.6	25.8	3.18
	2/2	Male	2	3.3	26.4	0.92	2	2.6	24.9	1.91
	Total	Male	50	54.9	43.1	6.49	55	52.9	40.9	7.69
		Female	41	45.1	45.6	3.76	49	47.1	47.2	3.90
1981-82	4/3	Male	2	14.3	37.9	5.36	3	25.0	39.0	6.12
		Female	1	7.1	47.6	-	1	8.3	47.5	-
	3/2	Male	6	42.9	39.7	8.97	1	8.3	37.2	-
		Female	5	35.7	45.5	5.01	6	50.0	47.9	6.15
	3/3	Male	0	-	-	-	1	8.3	27.4	-
	Total	Male	10	58.8	38.4	7.11	9	52.9	38.5	9.42
		Female	7	41.2	44.2	5.97	8	47.1	48.1	5.28

Appendix 17b. Sex and age composition and mean nose-fork length of Coho salmon sampled at the Salmon River enumeration fence, 1981.

Year	Age	Sex	Number sampled	Rel. percent	Mean length (cm)
1981-82	4/3	Male	27	17.8	42.4
		Female	29	19.1	43.5
	3/2	Male	29	19.1	42.1
		Female	20	13.2	46.2
	3/3	Male	7	4.6	25.9
	2/2	Male	40	26.3	25.9
	Total	Male	103	67.8	34.8
		Female	49	32.2	44.6

Appendix 18a. Summary of live observations and dead counts of coho salmon in the upper Pitt River and tributaries, 1981-82 (Note: Totals may include recoveries for which sex as unknown.)

			Dead Recoveries								
			Adipose Present				Adipose Absent				
Location	Date	Live Count	Male	Female	Jack	Total	Male	Female	Jack	Total	Total Dead
Blue Creek	Dec 8	305	3	9	0	12	1	2	0	3	15
	Dec 17	71	8	6	1	15	0	2	0	2	17
	Dec 30	72	15	28	2	45	2	3	0	5	50
	Jan 15	17	6	13	0	19	0	1	0	1	20
	Total	-	32	56	3	91	3	8	0	11	102
Boise Creek	Dec 3 a	117	2	6	0	8	0	1	0	1	9
	Dec 4 a	84	1	2	0	3	2	1	0	3	6
	Dec 15	177	11	4	0	15	3	2	0	5	20
	Dec 29	67	7	8	0	15	1	7	0	8	23
	Dec 31	-	2	0	0	2	0	0	0	0	2
	Jan 2 a	11	1	1	0	2	0	0	0	0	2
	Jan 14	33	3	8	0	11	0	4	0	4	15
	Total	-	27	29	0	56	6	15	0	21	77
1st Canyon Creek	Dec 16	13	0	2	0	2	0	2	0	2	4
	Dec 31	0	1	0	0	1	0	0	0	0	1
	Total	-	1	2	0	3	0	2	0	2	5
2nd Canyon Creek	Dec 17	15	1	1	0	2	0	0	0	0	2
	Jan 16	0	0	0	0	0	0	0	0	0	0
	Total	-	1	1	0	2	0	0	0	0	2
Corbold Creek	Jan 15	6	0	0	0	0	0	0	0	0	0
Fish Hatchery Cr.	Dec 4	62	2	0	0	2	0	0	0	0	2
	Dec 15	69	6	1	0	7	1	0	0	1	8
	Dec 18 a	0	0	2	0	2	0	0	0	0	2
	Dec 29	31	1	8	0	9	0	0	0	0	9
	Jan 15	3	1	1	0	2	0	0	0	0	2
	Total	-	10	12	0	22	1	0	0	1	23
Forestry Creek	Dec 4	3	1	2	0	3	1	1	0	2	5
	Dec 9	1	0	0	0	0	0	0	0	0	0
	Dec 16	11	0	0	0	0	1	0	0	1	1
	Dec 28	43	2	1	0	3	0	0	0	0	3
	Jan 1	25	1	0	0	1	0	0	0	0	1
	Jan 16	0	0	0	0	0	0	0	0	0	0
	Total	-	4	3	0	7	2	1	0	3	10
Garabaldi Creek	Dec 8	20	0	2	0	2	0	0	0	0	2

Appendix 18a. Summary of live observations and dead counts of coho salmon in the upper Pitt River and tributaries, 1981-82 (Note: Totals may include recoveries for which sex as unknown.)

Location	Date	Live Count	Dead Recoveries								Total Dead
			Adipose Present				Adipose Absent				
			Male	Female	Jack	Total	Male	Female	Jack	Total	
	Dec 17	8	1	1	0	2	0	0	0	0	2
	Dec 30	19	4	2	0	6	1	0	0	1	7
	Total	-	5	5	0	10	1	0	0	1	11
Homer Creek	Dec 16 a	40	1	2	0	3	0	0	0	0	3
	Dec 31	41	3	5	0	8	0	0	0	0	8
	Total	-	4	7	0	11	0	0	0	0	11
Peter's Slough	Dec 4	9	3	0	0	3	0	0	0	0	3
	Dec 18	0	0	0	0	0	0	0	0	0	0
	Jan 16	0	0	0	0	0	1	1	0	2	2
	Total	-	3	0	0	3	1	1	0	2	5
Pinecone Creek	Dec 16	0	0	0	0	0	0	0	0	0	0
Pitt River	Oct 18 b	-	0	0	0	0	1	0	0	1	1
	Oct 20 b	-	0	0	0	0	1	0	0	1	1
	Nov 29 c	875	0	0	0	0	0	0	0	0	0
	Dec 16 a	650	0	0	0	0	0	0	0	0	0
	Feb 3 c	0	0	0	0	0	0	0	0	0	0
	Total	-	0	0	0	0	2	0	0	2	2
R-400 Side Channel	Dec 9	33	2	1	0	3	0	0	0	0	3
	Dec 18	16	2	0	0	2	0	0	0	0	2
	Jan 16	0	0	0	0	0	0	0	0	0	0
	Total	-	4	1	0	5	0	0	0	0	5
Slough Creek	Dec 9	30	2	0	0	2	3	0	0	3	5
	Dec 18	45	1	1	0	2	0	1	0	1	3
	Jan 1	29	0	4	1	5	1	0	0	1	6
	Jan 15	2	0	0	0	0	0	0	0	0	0
	Total	-	3	5	1	9	4	1	0	5	14
Steve Creek	Dec 16	1	0	0	0	0	0	0	0	0	0
Unnamed Creek (25.5 Km)	Dec 17	4	0	1	0	1	0	0	0	0	1

a. Incomplete survey. b. Sampled from sport catch. c. Helicopter overflight.

Appendix 18b. Summary of live observations and dead counts of coho salmon in the upper Pitt River and tributaries, 1982-83 (Note: Totals may include recoveries for which sex was unknown).

Location	Date	Live Count	Dead Recoveries								Total Dead
			Adipose Present				Adipose Absent				
			Male	Female	Jack	Total	Male	Female	Jack	Total	
Blue Creek	Nov 10	4	0	0	0	0	0	0	0	0	0
	Dec 4	114	2	0	0	2	1	1	0	2	4
	Dec 8	49	3	0	0	3	0	0	0	0	3
	Dec 15	43	1	0	1	2	0	0	0	0	2
	Dec 20	317	8	4	0	12	2	0	0	2	14
	Dec 30	66	19	13	2	34	5	1	2	8	42
	Jan 4	107	29	29	2	63	5	5	0	10	73
	Jan 10	27	8	3	0	11	1	0	0	1	12
	Jan 13	77	16	20	0	36	1	1	0	2	38
	Jan 16	62	21	12	1	34	1	2	1	4	38
	Jan 25	35	33	30	0	63	5	5	0	10	73
	Jan 28	33	14	17	0	31	0	1	0	1	32
	Total	-	154	128	6	291	21	16	3	40	331
Boise Creek	Nov 9	55	1	1	0	2	0	0	0	0	2
	Dec 5	75	0	0	1	1	0	1	0	1	2
	Dec 19	181	2	0	0	2	1	0	0	1	3
	Dec 31	125	3	8	0	11	0	2	0	2	13
	Jan 4	57	5	9	0	14	2	1	0	3	17
	Jan 12	59	4	11	0	15	1	3	0	4	19
	Jan 15	70	7	3	0	10	2	3	0	5	15
	Jan 17 a	30	4	0	0	4	1	0	0	1	5
	Jan 24 a	15	4	8	0	12	0	3	0	3	15
	Jan 27	21	0	2	0	2	0	2	0	2	4
	Total	-	30	42	1	73	7	15	0	22	95
1st Canyon Creek	Nov 11	0	0	0	0	0	0	0	0	0	0
	Dec 20	7	0	0	0	0	0	0	0	0	0
	Jan 4	1	0	1	0	1	0	0	0	0	1
	Total	-	0	1	0	1	0	0	0	0	1
2nd Canyon Creek	Dec 8	20	0	0	0	0	0	0	0	0	0
	Dec 17	20	0	1	0	1	0	0	0	0	1
	Dec 30	6	2	1	0	3	0	1	0	1	4
	Jan 12	0	0	0	0	0	0	0	0	0	0
	Total	-	2	2	0	4	0	1	0	1	5
Corbold Creek	Dec 6	6	0	0	0	0	0	0	0	0	0
	Dec 15	3	0	0	0	0	0	0	0	0	0
	Jan 3	0	0	0	0	0	0	0	0	0	0
	Total	-	0	0	0	0	0	0	0	0	0

Appendix 18b. Summary of live observations and dead counts of coho salmon in the upper Pitt River and tributaries, 1982-83 (Note: Totals may include recoveries for which sex was unknown).

Location	Date	Live Count	Dead Recoveries								Total Dead
			Adipose Present				Adipose Absent				
			Male	Female	Jack	Total	Male	Female	Jack	Total	
Fish Hatchery Cr.	Nov 9	18	0	0	0	0	0	0	0	0	0
	Nov 23	0	0	0	0	0	0	0	0	0	0
	Nov 26 a	15	0	0	0	0	0	0	0	0	0
	Dec 7	52	0	0	0	0	0	0	0	0	0
	Dec 14	-	1	0	0	1	0	0	0	0	1
	Dec 16	49	1	0	0	1	0	0	0	0	1
	Jan 3	6	6	2	0	8	0	2	0	2	10
	Jan 11	1	1	0	0	1	0	0	0	0	1
	Jan 17 a	13	1	1	0	2	0	0	0	0	2
	Jan 26	1	0	3	0	3	0	0	0	0	3
	Total	-	10	6	0	16	0	2	0	2	18
Forestry Creek	Nov 11	0	0	0	0	0	0	0	0	0	0
	Nov 23	1	0	0	0	0	0	0	0	0	0
	Dec 6	71	0	0	0	0	0	0	0	0	0
	Dec 17	75	0	1	0	1	0	0	0	0	1
	Dec 29	97	2	4	0	6	0	1	0	1	7
	Jan 1	-	3	2	0	5	0	1	0	1	6
	Jan 4	43	2	3	0	5	0	0	0	0	5
	Jan 5	52	0	1	0	1	0	0	0	0	1
	Jan 11	1	4	8	0	14	0	0	0	0	14
	Jan 14	6	0	1	0	1	0	0	0	0	1
	Jan 27	7	0	2	0	2	0	0	0	0	2
	Total	-	11	22	0	35	0	2	0	2	37
Garabaldi Creek	Nov 10	0	0	0	0	0	0	0	0	0	0
	Nov 22	0	0	0	0	0	0	0	0	0	0
	Dec 2	27	0	0	0	0	0	0	0	0	0
	Dec 15	15	0	0	0	0	0	0	0	0	0
	Dec 30	7	0	1	0	1	0	0	0	0	1
	Jan 16	30	5	3	0	8	0	0	0	0	8
	Jan 25	5	0	5	0	5	0	1	0	1	6
	Total	-	5	9	0	14	0	1	0	1	15
Homer Creek	Nov 11	10	0	0	0	0	0	0	0	0	0
	Dec 7	32	0	0	0	0	0	0	0	0	0
	Dec 20	174	0	0	0	0	0	0	0	0	0
	Jan 2	55	5	8	0	13	0	1	0	1	14
	Jan 5	81	9	13	2	24	0	0	0	0	24
	Jan 14	22	4	5	0	9	1	0	0	1	10
	Jan 26	7	2	4	0	6	0	0	0	0	6
	Total	-	20	30	2	52	1	1	0	2	54

Appendix 18b. Summary of live observations and dead counts of coho salmon in the upper Pitt River and tributaries, 1982-83 (Note: Totals may include recoveries for which sex was unknown).

			Dead Recoveries								
			Adipose Present				Adipose Absent				
Location	Date	Live Count	Male	Female	Jack	Total	Male	Female	Jack	Total	Total Dead
Peter's Slough	Nov 12	2	2	0	0	2	0	0	0	0	2
	Nov 25	0	0	0	0	0	0	0	0	0	0
	Dec 18	11	1	1	0	2	0	0	0	0	2
	Jan 3	4	1	0	0	1	0	0	0	0	1
	Jan 11	1	0	0	0	0	0	0	0	0	0
	Total	-	4	1	0	5	0	0	0	0	5
Pitt River	Oct 20 b	-	0	0	0	0	0	1	1	2	2
	Nov 11 b,c	2192	2	3	0	5	0	0	0	0	5
	Nov 12 b	-	0	1	0	1	0	0	0	0	1
	Nov 18 c	5125	0	0	0	0	0	0	0	0	0
	Dec 9	1124	0	0	0	0	0	0	0	0	0
	Jan 15 b	-	0	1	0	1	0	0	0	0	1
	Total	-	2	5	0	7	0	1	1	2	9
R-400 Side Channel	Nov 12	51	0	0	0	0	0	0	0	0	0
	Dec 7	34	0	0	0	0	0	0	0	0	0
	Dec 18	34	0	2	0	2	0	0	0	0	2
	Jan 3	17	1	3	0	4	0	0	0	0	4
	Total	-	1	5	0	6	0	0	0	0	6
Slough Creek	Nov 10	10	1	0	0	1	0	0	0	0	1
	Dec 6	102	1	0	0	1	1	0	0	1	2
	Dec 16	-	1	0	0	1	0	0	0	0	1
	Dec 21	112	2	2	0	4	1	2	0	3	7
	Jan 2	37	5	5	0	10	2	0	0	2	12
	Jan 4 a	21	1	9	0	10	0	1	0	1	11
	Jan 11	11	12	5	0	19	3	5	0	8	27
	Jan 14	17	0	1	0	1	0	0	0	0	1
	Jan 17	12	1	5	0	6	1	1	0	2	8
	Jan 24	2	0	2	0	2	0	0	0	0	2
	Total	-	24	29	0	55	8	9	0	17	72

a. Incomplete survey.
b. Sampled from sport catch.
c. Helicopter overflight.

Appendix 18c. Summary of live observations and dead counts of coho salmon in the upper Pitt River and tributaries, 1983-84 (Note: Totals may include recoveries for which sex was unknown).

			Dead Recoveries								
			Adipose Present				Adipose Absent				
Location	Date	Live Count	Male	Female	Jack	Total	Male	Female	Jack	Total	Total Dead
Blue Creek	Nov 25	9	0	0	0	0	0	0	0	0	0
	Dec 15	34	2	0	0	2	0	0	0	0	2
	Jan 18	69	7	7	0	14	0	0	0	0	14
	Jan 31	17	11	8	0	19	0	0	0	0	19
	Total	-	20	15	0	35	0	0	0	0	35
Boise Creek	Dec 14	4	3	3	0	6	0	0	0	0	6
	Jan 9	52	0	2	0	2	1	0	0	1	3
	Jan 17	35	2	1	0	3	0	0	0	0	3
	Jan 24 b	15	1	1	0	2	0	1	0	1	3
	Feb 2	6	0	2	0	2	0	0	0	0	2
	Feb 16	0	0	1	0	1	0	0	0	0	1
	Total	-	6	10	0	16	1	1	0	2	18
Fish Hatchery Cr.	Dec 13 a	20	0	0	0	0	0	0	0	0	0
	Jan 8 a	125	1	0	0	1	0	0	0	0	1
	Jan 16 a	76	19	12	0	31	1	0	0	1	32
	Jan 24 a	21	12	8	0	20	0	0	0	0	20
	Jan 30 a	10	3	3	0	6	0	0	0	0	6
	Feb 1 a	3	2	2	0	4	0	0	0	0	4
	Feb 15	0	0	1	0	1	0	0	0	0	1
	Total	-	37	26	0	63	1	0	0	1	64
Forestry Creek	Dec 16	100	0	0	0	0	0	0	0	0	0
	Jan 9	2	2	1	0	3	0	0	0	0	3
	Jan 19	19	0	0	0	0	0	0	0	0	0
	Jan 27	7	2	5	0	7	0	0	0	0	7
	Feb 1	5	3	0	0	3	0	1	0	1	4
	Total	-	7	6	0	13	0	1	0	1	14
Homer Creek	Jan 25	21	0	0	0	0	0	0	0	0	0
Peter's Slough	Jan 27	13	4	1	0	5	0	0	0	0	5
Pitt River	Oct 10 b	1180	0	0	0	0	0	0	0	0	0
	Nov 22 b	2648	0	0	0	0	0	0	0	0	0
Slough Creek	Dec 13	0	0	2	0	2	0	0	0	0	2
	Jan 7	12	2	0	0	2	0	0	0	0	2
	Jan 17	16	1	1	0	2	0	0	0	0	2
	Jan 24	10	0	2	0	2	0	0	0	0	2
	Total	-	3	5	0	8	0	0	0	0	8

Appendix 18c. Summary of live observations and dead counts of coho salmon in the upper Pitt River and tributaries, 1983-84 (Note: Totals may include recoveries for which sex was unknown).

Location	Date	Live Count	Dead Recoveries								Total Dead
			Adipose Present				Adipose Absent				
			Male	Female	Jack	Total	Male	Female	Jack	Total	

a. Incomplete survey.

b. Helicopter overflight.

Appendix 19. Summary of disk tag application results in the upper Pitt River, 1982-83 (Unadjusted).

		Adipose present				Adipose absent			Total			
Date	Location	Male	Female	Jack	Total	Male	Female	Total	Male	Female	Jack	Total
Nov 13	Km 17.0	47	28	5	80	4	6	10	51	34	5	90
	Km 16.0	26	4	5	35	2	0	2	28	4	5	37
Nov 14	Km 16.0	36	18	3	57	8	4	12	44	22	3	69
	Km 15.8	7	4	1	12	1	0	1	8	4	1	13
	Km 15.6	24	16	3	43	1	1	2	25	17	3	45
	Km 14.5	53	57	1	111	5	9	14	58	66	1	125
Nov 22	Km 26.4	49	35	0	84	3	4	7	52	39	0	91
Nov 23	Km 24.8	21	4	0	25	1	1	2	22	5	0	27
	Km 24.5	120	72	0	192	16	5	21	136	77	0	213
Total	-	383	238	18	639	41	30	71	424	268	18	710

Appendix 20. Summary of disk tag application and recovery results by sex and adipose clip status of coho salmon in the upper Pitt River system, 1982-83.

	Disk tags applied	Carcasses examined	Disk tag recoveries	Disk tag recovery rate (%)
Adults:				
- Males	428	298	37	8.6
- Females	228	322	24	10.5
- Sex unknown	-	7	1	-
- Total	656	627	62	9.5
- Adipose present	587	540	53	9.0
- Adipose absent	69	87	9	13.0
Jacks:				
- Adipose present	18	9	0	0.0
- Adipose absent	0	3	0	0.0
- Total	18	12	0	0.0

a. Corrected for sex identification error, tag loss and tagging related mortality.

Appendix 21. Summary of disk tag recoveries in the upper Pitt River system, 1982-83.

Disk tag application					Disk tag recovery				
Location	Date	Nose-fork length	Sex	Adipose clip	Location	Date	POH length	Sex	Time out (Days)
Km 17.0	Nov 13	66.7	Male	No	Blue Cr.	Jan 04	49.5	Male	52
	Nov 13	66.8	Female	Yes	Forestry Cr.	Jan 01	56.0	Female	49
	Nov 13	70.3	Female	No	Boise Cr.	Jan 24	56.0	Female	72
	Nov 13	62.0	Female	No	Homer Cr.	Jan 02	N/R	Female	49
	Nov 13	41.0	Male	No	Blue Cr.	Jan 04	33.5	Male	52
	Nov 13	66.2	Female	No	Blue Cr.	Jan 13	54.0	Female	61
Km 16.0	Nov 13	68.0	Male	Yes	Slough Cr.	Jan 02	52.0	Male	50
	Nov 14	77.0	Male	No	Forestry Cr.	Dec 29	58.7	Male	45
	Nov 14	64.2	Male	No	Blue Cr.	Jan 04	49.5	Male	51
	Nov 14	65.0	Female	No	Slough Cr.	Jan 04	53.0	Female	51
	Nov 14	64.7	Female	Yes	Blue Cr.	Jan 25	50.0	Female	72
	Nov 14	49.0	Male	No	Boise Cr.	Jan 27	a	a	74
	Nov 14	56.3	Female	No	Forestry Cr.	Dec 29	43.2	Female	45
	Nov 14	44.9	Male	No	Blue Cr.	Jan 25	35.0	Male	72
	Nov 14	56.0	Female	No	Blue Cr.	Jan 28	44.5	Female	75
Km 15.8	Nov 14	49.2	Male	No	Forestry Cr.	Jan 11	38.0	Male	58
Km 15.6	Nov 14	64.2	Female	No	Homer Cr.	Jan 02	b	b	49
	Nov 14	72.0	Female	No	Homer Cr.	Jan 02	61.5	Female	49
	Nov 14	60.5	Female	Yes	Slough Cr.	Dec 21	50.4	Female	37
	Nov 14	69.4	Female	No	Blue Cr.	Dec 30	54.5	Male	46
	Nov 14	75.2	Male	No	Boise Cr.	Jan 04	51.0	Male	51
Km 14.5	Nov 14	71.5	Female	No	Slough Cr.	Jan 11	53.0	Male	58
	Nov 14	75.3	Female	No	Boise Cr.	Jan 15	58.0	Female	62
	Nov 14	69.5	Female	No	Forestry Cr.	Jan 04	53.5	Female	51
	Nov 14	66.7	Male	No	Slough Cr.	Jan 11	53.0	Male	58
	Nov 14	67.3	Female	Yes	Boise Cr.	Jan 04	54.0	Female	51
	Nov 14	58.0	Female	No	Boise Cr.	Jan 12	b	b	59
	Nov 14	50.5	Male	No	Blue Cr.	Jan 28	40.0	Male	75
Km 26.4	Nov 22	65.0	Male	No	Blue Cr.	Jan 28	51.0	Male	67
	Nov 22	67.0	Female	No	Blue Cr.	Jan 13	54.5	Female	52
	Nov 22	70.2	Female	No	Blue Cr.	Dec 20	58.3	Female	28
	Nov 22	41.4	Male	No	Blue Cr.	Jan 04	32.5	Male	43
	Nov 22	61.0	Female	No	Blue Cr.	Jan 16	48.0	Male	55
	Nov 22	74.0	Male	No	Blue Cr.	Dec 30	58.5	Male	38
	Nov 22	52.0	Male	No	Blue Cr.	Jan 13	43.5	Male	52
	Nov 22	51.0	Male	No	Blue Cr.	Jan 04	40.9	Male	43
Km 24.8	Nov 23	55.5	Male	No	Blue Cr.	Jan 13	44.0	Male	51
	Nov 23	50.0	Male	No	Blue Cr.	Jan 16	b	b	54
	Nov 23	58.0	Female	No	Blue Cr.	Jan 25	47.0	Female	63
	Nov 23	52.0	Male	No	Blue Cr.	Jan 04	41.0	Male	42

Appendix 21. Summary of disk tag recoveries in the upper Pitt River system, 1982-83.

Disk tag application					Disk tag recovery				
Location	Date	Nose-fork length	Sex	Adipose clip	Location	Date	POH length	Sex	Time out (Days)
Km 24.5	Nov 23	48.0	Male	No	Blue Cr.	Jan 13	42.0	Male	51
	Nov 23	55.0	Male	No	Blue Cr.	Dec 30	42.3	Male	37
	Nov 23	51.5	Male	No	Blue Cr.	Jan 10	b	b	48
	Nov 23	50.5	Male	Yes	Blue Cr.	Jan 25	b	b	63
	Nov 23	71.0	Male	No	Blue Cr.	Dec 30	53.0	Male	37
	Nov 23	71.5	Female	No	Blue Cr.	Dec 30	57.2	Female	37
	Nov 23	68.0	Male	No	Blue Cr.	Dec 30	51.7	Male	37
	Nov 23	68.0	Male	No	Blue Cr.	Jan 13	46.5	Male	51
	Nov 23	73.0	Female	Yes	Blue Cr.	Jan 25	58.0	Female	63
	Nov 23	47.0	Male	No	Blue Cr.	Jan 13	38.0	Male	51
	Nov 23	63.0	Female	No	Blue Cr.	Jan 13	55.0	Female	51
Km 24.4 c	Nov 23	-	-	No	Blue Cr.	Dec 08	45.0	Male	15
	Nov 23	-	-	No	Blue Cr.	Dec 20	56.0	Female	27
	Nov 23	-	-	No	Blue Cr.	Dec 20	52.3	Male	27
	Nov 23	-	-	Yes	Blue Cr.	Dec 20	57.0	Male	27
	Nov 23	-	-	No	Blue Cr.	Dec 20	50.7	Male	27
	Nov 23	-	-	No	Blue Cr.	Dec 30	48.8	Female	37
	Nov 23	-	-	No	Blue Cr.	Dec 30	41.0	Male	37
	Nov 23	-	-	Yes	Blue Cr.	Jan 04	56.0	Male	42
	Nov 23	-	-	No	Blue Cr.	Jan 04	49.0	Male	42
	Nov 23	-	-	Yes	Blue Cr.	Jan 04	52.5	Male	42
	Nov 23	-	-	No	Blue Cr.	Jan 04	53.5	Female	42
	Nov 23	-	-	No	Blue Cr.	Jan 04	48.1	N/R	42
	Nov 23	-	-	No	Blue Cr.	Jan 13	52.0	Female	51
	Nov 23	-	-	No	Blue Cr.	Jan 16	52.0	Male	54
	Nov 23	-	-	No	Blue Cr.	Jan 16	53.0	Female	54
	Nov 23	-	-	No	Blue Cr.	Jan 25	63.0	Male	63
	Nov 23	-	-	No	Blue Cr.	Jan 25	39.0	Male	63

a. Tag only recovered; not used in population estimation.

b. Partial carcass or condition too poor for sampling; not used in population estimation.

c. Tagged with unnumbered disks.

Appendix 22a. Summary of coho adult disk tag incidence by time period in the upper Pitt River spawning ground recovery sample, 1982-83.

Recovery period	Total recoveries	Disk tags	%
Nov 09 - Nov 12	5	0	0.0
Nov 18 - Nov 26	0	0	-
Dec 02 - Dec 09	10	1	10.0
Dec 14 - Dec 21	34	6	17.6
Dec 29 - Jan 05	238	29	12.2
Jan 10 - Jan 17	197	16	8.1
Jan 24 - Jan 28	143	10	7.0
Total	627	62	9.9

Appendix 22b. Summary of coho adult disk tag incidence by location in the upper Pitt River spawning ground sample, 1982-83.

Location a	Carcass recovery	No. with disk tags	%
Lower:			
- Boise Creek	94	4	4.3
- Fish Hatchery Creek	18	0	0.0
- Homer Creek	52	2	3.8
- Peter's Slough	5	0	0.0
- R-400 Side Channel	6	0	0.0
- Slough Creek	72	5	6.9
- Total	247	11	4.5
Middle:			
- 1st Canyon Creek	1	0	0.0
- 2nd Canyon Creek	5	0	0.0
- Forestry Creek	37	5	13.5
- Total	43	5	11.6
Upper:			
- Blue Creek	322	46	14.3
- Garabaldi Creek	15	0	0.0
- Total	337	46	13.6
Grand total:	627	62	9.9

a. Lower - below First Canyon;
Middle - First Canyon to Second Canyon;
Upper - Above Second Canyon.

Appendix 22c. Sex composition of coho adults in the disk tag application and spawning ground samples in the upper Pitt River, 1982-83.

	Disk tag application sample a			Spawning ground sample b		
	Recovered on spawning grounds a	Not recovered	Total	Disk tag present	Disk tag absent b	Total
% Male	60.7	65.7	65.2	60.7	46.7	48.1
% Female	39.3	34.3	34.8	39.3	53.3	51.9
Sample size	61	594	656	61	559	620

a. Excludes 1 adult, sex unknown.
b. Excludes 7 adults, sex unknown.

Appendix 23. Stratified mark-recapture population estimate for upper Pitt River coho adults, 1982-83.

	Location of tagging a			Disk tag recoveries (Ri)	Total recoveries (Ci)	Ci/Ri
	Lower	Middle	Upper			
Location of recovery: a						
Lower	7	4	0	11	247	22.45
Middle	2	3	0	5	43	8.60
Upper	2	7	37	46	337	7.33
Total tags recovered (Ri):	11	14	37			
Total tags applied (Mi): b	172	173	311			
Mi/Ri:	15.64	12.36	8.41			
Population estimate:				Total escapement		
Lower	2,458	1,110	0	3,568		
Middle	269	319	0	588		
Upper	229	634	2,278	3,141		
				7,297		

a. Lower, middle and upper are defined as below First Canyon, bottom of First Canyon to top of Second Canyon, and Above Second Canyon, respectively.
b. Corrected for disk tag loss and tagging related mortality.

Appendix 24. Estimated total escapement and escapement of adipose clipped Coho adults to the Upper Pitt River System, 1981-82 to 1983-84.

	1981-82	1982-83	1983-84
Spawner-days:			
- Boise Creek	5,958.0	6,942.0	1,925.0
- Blue Creek	5,813.0	10,407.0	3.993.5
- Fish Hatchery Creek	2,807.0	1,632.0	3,175.0
- Forestry Creek	1,012.5	2,996.5	3,217.0
- Slough Creek	1,335.0	4,233.5	424.0
- Total	16,205.5	26,211.0	12,734.5
Escapement:	4512	7,297	3,545
Adipose Clips: a			
- Sample Size	262	692	370
- Mark Incidence	0.1368 b	0.1026	0.0216
- Adipose Clip Escapement	617	749	77

a. From Appendix 25.

b. Product of the spawning ground sample incidence (.176) and the correction factor (.777) (see text).

Appendix 25. Adipose clip incidence in upper Pitt River coho adults examined during disk tag application and carcass recovery, 1981-82 to 1983-84.

Location	1981-82			1982-83			1983-84		
	Adults examined	No. with adipose clips	%	Adults examined	No. with adipose clips	%	Adults examined	No. with adipose clips	%
Carcass recovery sample: a									
- Blue Creek	99	11	11.1	322	37	11.5	35	0	0.0
- Boise Creek	77	21	27.3	94	22	23.4	18	2	11.1
- 1st Canyon Creek	5	2	40.0	1	0	0.0	0	0	-
- 2nd Canyon Creek	2	0	0.0	5	1	20.0	0	0	-
- Fish Hatchery Creek	23	1	4.3	18	2	11.1	64	1	1.6
- Forestry Creek	10	3	30.0	37	2	5.4	14	1	7.1
- Garabaldi Creek	11	1	9.1	15	1	6.7	0	0	-
- Homer Creek	11	0	0.0	52	2	3.8	0	0	-
- Peter's Slough	5	2	40.0	5	0	0.0	5	0	0.0
- R-400 Side Channel	5	0	0.0	6	0	0.0	0	0	-
- Slough Creek	13	5	38.5	72	17	23.6	8	0	0.0
- Unnamed Creek (25.5Km)	1	0	0.0	0	0	-	0	0	-
- CWT release sites	243	44	18.1	563	81	14.4	144	4	2.8
- Nonrelease sites	19	2	10.5	64	3	4.7	0	0	-
- Total	262	46	17.6	627	84	13.4	144	4	2.8
Disk tag application sample:	-	-	-	692	71	10.3	370	8	2.2

a. Pitt River angler samples excluded.

Appendix 26a. Observed and estimated coho adult escapement by CWT code in the upper Pitt River system, 1981-82.

Return year	Estimated total adipose clipped escapement	Number of adipose clips recovered	Observed codes				Escapement		
			02 16 60	02 16 62	No tag	Tag lost	02 16 60	02 16 62	No tag
1981-82	617	46	16	18	8	4	240	270	107

Appendix 26b. Observed and estimated coho adult escapement by CWT code in the upper Pitt River system, 1982-83.

Return year	Estimated total adipose clipped escapement	Number of adipose clips recovered	Observed codes					Escapement			
			02 16 62	02 18 02	02 18 03	No tag	Tag lost	02 16 62	02 18 02	02 18 03	No tag
1982-83	749	84	3	22	27	12	20	36	267	339	107

Appendix 26c. Observed and estimated coho adult escapement by CWT code in the upper Pitt River system, 1983-84.

Return year	Estimated total adipose clipped escapement	Number of adipose clips recovered	Observed codes			Escapement	
			02 18 03	No tag	Tag lost	02 18 03	No tag a
1983-84	77	4	3	0	1	66	11

a. Due to small sample size, 1982-83 CWT loss rate used.

Appendix 27. Sex and age composition and mean postorbital-hypural plate lengths of coho salmon recovered in the upper Pitt River system.

Year	Age	Sex	Number Sampled	Rel. Percent	Mean Length (cm)	s
1981-82	4/3	Male	26	11.5	42.6	7.45
		Female	35	15.5	50.3	4.42
	3/2	Male	70	31.0	43.3	7.83
		Female	94	41.6	49.0	4.30
	2/2	Male	1	0.4	23.3	-
	Total	Male	118	44.0	42.0	8.14
		Female	150	56.0	49.4	4.30
1982-83	4/3	Male	6	1.4	51.5	7.97
		Female	12	2.7	52.9	4.10
	3/2	Male	188	42.3	48.4	8.03
		Female	229	51.6	53.2	4.21
	2/2	Male	9	2.0	26.9	2.85
	Total	Male	312	48.9	46.8	9.50
		Female	326	51.1	53.2	4.07
1983-84	4/3	Male	10	9.1	45.9	6.89
		Female	4	3.6	47.8	5.56
	3/2	Male	54	49.1	47.7	7.10
		Female	42	38.2	46.9	4.09
	2/2	Male	0	0.0	-	-
	Total	Male	81	56.3	47.1	6.80
		Female	63	43.8	46.8	4.50

1982-83 NF-POHL Regressions:

- Male: NF (cm) = 1.43 POHL (cm) - 6.06; r = 0.96; n = 27
- Female: NF (cm) = 1.09 POHL (cm) - 7.91; r = 0.92; n = 17

Appendix 28a. Daily fence trap catches of coho salmon in Salwein Creek (Vedder-Chilliwack system), 1982-83.

	Adipose Present			Adipose Absent			Catch	
Date	Male	Female	Jack	Male	Female	Jack	Total	Cum.
03-Dec	-	1	-	-	-	1	2	2
04-Dec	3	4	-	-	-	6	13	15
05-Dec	25	25	-	-	-	11	61	76
06-Dec	34	19	-	-	-	32	85	161
07-Dec	-	3	-	-	-	7	10	171
08-Dec	2	1	-	-	-	1	4	175
09-Dec	-	-	-	-	-	-	0	175
10-Dec	-	-	-	-	-	-	0	175
11-Dec	-	-	-	-	-	-	0	175
12-Dec	-	-	-	-	-	-	0	175
13-Dec	-	-	-	-	-	-	0	175
14-Dec	-	-	-	-	-	-	0	175
15-Dec	-	-	-	-	-	-	0	175
16-Dec	2	-	-	-	-	1	3	178
17-Dec	-	1	-	-	-	8	9	187
18-Dec	5	4	3	-	-	9	21	208
19-Dec	7	12	-	-	-	15	34	242
20-Dec	-	2	-	-	-	4	6	248
21-Dec	1	1	-	-	-	2	4	252
22-Dec	-	1	-	-	-	-	1	253
23-Dec a	-	-	-	-	-	-	0	253
24-Dec a	-	-	-	-	-	-	0	253
25-Dec a	-	-	-	-	-	-	0	253
26-Dec a	-	-	-	-	-	-	0	253
27-Dec a	-	-	-	-	-	-	0	253
28-Dec a	-	-	-	-	-	-	0	253
29-Dec a	-	-	-	-	-	-	0	253
30-Dec a	-	-	-	-	-	-	0	253
31-Dec a	-	-	-	-	-	-	0	253
01-Jan a	-	-	-	-	-	-	0	253
02-Jan a	-	-	-	-	-	-	0	253
03-Jan a	-	-	-	-	-	-	0	253
04-Jan	4	-	-	-	-	-	4	257
05-Jan	33	33	-	-	-	-	66	323
06-Jan	18	30	2	-	-	47	97	420
07-Jan	49	56	1	-	-	-	106	526
08-Jan	3	17	-	-	-	6	26	552
09-Jan	29	48	-	-	-	40	117	669
10-Jan b	-	-	-	-	-	-	0	669
11-Jan	20	38	3	-	-	39	100	769
12-Jan	3	4	-	-	-	-	7	776
13-Jan	3	5	-	-	-	16	24	800
14-Jan	1	1	-	-	-	-	2	802
15-Jan	-	-	-	-	-	-	0	802
16-Jan	-	-	-	-	-	-	0	802
17-Jan	-	-	-	-	-	-	0	802
18-Jan	-	-	-	-	-	-	0	802
19-Jan	-	-	-	-	-	-	0	802
20-Jan	-	-	-	-	-	-	0	802

Appendix 28a. Daily fence trap catches of coho salmon in Salwein Creek (Vedder-Chilliwack system), 1982-83.

	Adipose Present			Adipose Absent			Catch	
Date	Male	Female	Jack	Male	Female	Jack	Total	Cum.
21-Jan	-	-	-	-	-	-	0	802
22-Jan	1	2	-	-	-	4	7	809
23-Jan	-	-	-	-	-	-	0	809
24-Jan to 07-Mar	?	?	?	?	?	48	48	857
Total	243	308	9	0	0	297	857	857

a. Fence removed for holidays.
b. Fence out due to high water.

Appendix 28b. Daily fence trap catches of coho salmon in Salwein Creek (Vedder-Chilliwack system), 1983-84.

	Adipose Present			Adipose Absent			Catch	
Date	Male	Female	Jack	Male	Female	Jack	Total	Cum.
25-Nov	-	-	-	-	-	-	0	0
26-Nov	-	-	1	1	2	-	4	4
27-Nov	-	-	1	1	2	-	4	8
28-Nov	-	-	3	-	1	2	6	14
29-Nov	-	-	-	-	-	2	2	16
30-Nov	-	-	-	-	-	-	0	16
01-Dec	-	-	-	-	-	-	0	16
02-Dec	-	-	1	-	-	1	2	18
03-Dec	-	-	-	-	-	-	0	18
04-Dec	-	-	-	-	-	-	0	18
05-Dec	-	-	-	-	-	-	0	18
06-Dec	-	-	-	-	-	-	0	18
07-Dec	-	-	1	-	-	-	1	19
08-Dec	-	-	-	-	-	-	0	19
09-Dec	-	-	-	-	-	-	0	19
10-Dec	-	-	-	-	-	-	0	19
11-Dec	-	-	-	-	-	-	0	19
12-Dec	-	-	-	-	-	-	0	19
13-Dec	3	2	-	7	5	-	17	36
14-Dec	1	1	-	4	3	-	9	45
15-Dec	3	3	2	6	4	3	21	66
16-Dec	1	1	4	6	1	1	14	80
17-Dec	-	-	-	-	-	-	0	80
18-Dec	-	-	-	-	-	-	0	80
19-Dec	-	-	-	-	-	-	0	80
20-Dec	-	-	-	-	-	-	0	80
21-Dec a	-	-	-	-	-	-	0	80
22-Dec a	-	-	-	-	-	-	0	80
23-Dec a	-	-	-	-	-	-	0	80
24-Dec a	-	-	-	-	-	-	0	80
25-Dec a	-	-	-	-	-	-	0	80
26-Dec a	-	-	-	-	-	-	0	80
27-Dec a	-	-	-	-	-	-	0	80
28-Dec a	-	-	-	-	-	-	0	80
29-Dec	-	2	1	2	-	-	5	85
30-Dec	-	-	-	-	-	-	0	85
31-Dec	1	1	1	-	-	-	3	88
01-Jan	1	-	1	-	-	-	2	90
02-Jan	-	1	-	5	2	-	8	98
03-Jan	3	2	1	17	12	-	35	133
04-Jan b	-	-	-	-	-	-	0	133
05-Jan b	-	-	-	-	-	-	0	133
06-Jan b	-	-	-	-	-	-	0	133
07-Jan b	-	-	-	-	-	-	0	133
08-Jan	-	4	8	21	35	10	78	211
09-Jan	-	2	3	7	19	2	33	244
10-Jan	-	-	-	11	15	-	26	270
11-Jan	-	1	-	2	4	-	7	277
12-Jan	1	-	3	6	9	6	25	302

Appendix 28b. Daily fence trap catches of coho salmon in Salwein Creek (Vedder-Chilliwack system), 1983-84.

	Adipose Present			Adipose Absent			Catch	
Date	Male	Female	Jack	Male	Female	Jack	Total	Cum.
13-Jan	-	-	2	-	2	-	4	306
14-Jan	-	-	-	1	5	-	6	312
15-Jan	-	-	-	-	-	-	0	312
16-Jan	-	-	-	-	-	-	0	312
17-Jan	-	-	-	-	-	-	0	312
18-Jan	-	-	-	1	-	-	1	313
19-Jan	-	-	-	-	-	-	0	313
20-Jan	-	-	-	-	-	-	0	313
21-Jan	-	-	-	-	-	-	0	313
22-Jan	-	-	-	-	-	-	0	313
23-Jan	-	-	-	1	2	-	3	316
24-Jan	-	-	-	6	10	-	16	332
25-Jan	-	-	-	7	9	-	16	348
26-Jan	-	-	-	2	11	-	13	361
27-Jan	-	-	-	8	13	1	22	383
28-Jan	-	-	-	-	-	-	0	383
29-Jan	-	-	-	-	-	-	0	383
30-Jan	-	-	-	-	-	-	0	383
31-Jan	-	-	-	-	-	-	0	383
01-Feb	1	-	-	-	-	-	1	384
02-Feb	-	-	-	-	-	-	0	384
03-Feb	-	-	-	-	-	-	0	384
04-Feb	-	-	-	-	-	-	0	384
05-Feb	-	-	-	-	-	-	0	384
06-Feb	-	-	-	-	-	-	0	384
07-Feb	-	1	-	-	-	-	1	385
08-Feb	-	-	-	-	-	-	0	385
09-Feb	-	-	1	-	1	-	2	387
10-Feb	-	-	-	-	3	-	3	390
Total	15	21	34	122	170	28	390	390

a. Fence out due to ice formation.

b. Fence out due to high water.

Appendix 29. Summary of coho adult disk tag application results in Salwein Creek, 1983-84.

Date	Adipose Present			Adipose Absent			Adjusted total a		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
10-Jan	-	-	0	22	50	72	17	38	55
11-Jan b	1	-	1	12	3	15	13	3	16
13-Jan	-	-	0	6	25	31	4	18	22
18-Jan	-	-	0	-	1	1	-	1	1
25-Jan	-	-	0	7	9	16	5	8	13
27-Jan	-	-	0	2	11	13	2	10	12
30-Jan	-	-	0	3	9	12	1	9	10
Total	1	0	1	52	108	160	42	87	129

a. 32 disk tags eliminated due to tagging related mortality.

b. Disk tags applied to coho adults captured in the creek; all other disk tags applied at the fence.

Appendix 30. Detailed summary of disk tag application and recovery sample information for disk tagged adults recovered in Salwein Creek, 1983-84.

Disk tag application					Disk tag recovery				
Date	Location	Nose-fork length (cm)	Sex	Adipose clip	Date	Location a	POHL length (cm)	Sex	Time out (days)
10-Jan	Fence	52	M	Yes	25-Jan	Fence	42.1	M	15
		60	F	Yes	03-Feb	1	48.2	F	24
		51	M	Yes	30-Jan	3	40.4	M	20
		55	F	Yes	06-Feb	Fence	44.8	F	27
		56	F	Yes	30-Jan	Fence	44.4	F	20
		57	M	Yes	25-Jan	1	44.9	F b	15
		54	F	Yes	01-Feb	Fence	43.5	F	22
		53	M	Yes	06-Feb	Fence	39.2	M	27
		49	F	Yes	01-Feb	Fence	39.3	F	22
		59	F	Yes	06-Feb	1	46.8	F	27
		54	M	Yes	01-Feb	Fence	41.0	F b	22
		56	F	Yes	06-Feb	4	43.6	F	27
		53	F	Yes	01-Feb	4	41.8	F	22
		53	F	Yes	06-Feb	2	42.8	F	27
		51	F	Yes	25-Jan	Fence	39.8	F	15
		49	M	Yes	23-Jan	4	36.7	M	13
		54	F	Yes	01-Feb	2	40.2	F	22
		52	M	Yes	25-Jan	Fence	41.5	F b	15
		54	F	Yes	01-Feb	2	n/r	F	22
		53	F	Yes	23-Jan	Fence	43.7	F	13
		46	F	Yes	23-Jan	2	36.1	F	13
		45	F	Yes	01-Feb	3	38.7	F	22
		52	F	Yes	01-Feb	Fence	42.6	F	22
		63	F	Yes	06-Feb	1	50.3	F	27
		44	M	Yes	25-Jan	Fence	34.8	M	15
		52	F	Yes	30-Jan	Fence	44.0	F	20
		52	F	Yes	27-Jan	Fence	44.2	F	17
		54	F	Yes	23-Jan	Fence	43.9	F	13
		55	F	Yes	27-Jan	3	43.7	F	17
		68	F	Yes	23-Jan	3	53.9	F	13
		49	F	Yes	01-Feb	Fence	38.7	F	22
		54	F	Yes	27-Jan	4	42.3	M b	17
		55	F	Yes	01-Feb	3	43.5	F	22
		49	F	Yes	25-Jan	Fence	38.0	F	15
		51	F	Yes	23-Jan	1	40.3	F	13
11-Jan	Middle branch	53	M	Yes	01-Feb	1	40.3	F b	21
		62	F	Yes	18-Jan	3	n/r	F	7
		43	M	Yes	17-Jan	3	n/r	M	6
		53	M	Yes	17-Jan	3	n/r	M	6
		53	M	Yes	17-Jan	3	n/r	M	6
13-Jan	Fence	46	M	Yes	01-Feb	Fence	35.7	F b	19
		52	F	Yes	25-Jan	Fence	42.1	F	12
		53	F	Yes	27-Jan	3	44.9	F	14
		48	F	Yes	03-Feb	Fence	36.9	F	21
		54	F	No	01-Feb	Fence	41.4	F	19
		52	M	Yes	06-Feb	1	39.2	F b	24

Appendix 30. Detailed summary of disk tag application and recovery sample information for disk tagged adults recovered in Salwein Creek, 1983-84.

Disk tag application					Disk tag recovery				
Date	Location	Nose-fork length (cm)	Sex	Adipose clip	Date	Location a	POHL length (cm)	Sex	Time out (days)
		50	F	Yes	25-Jan	3	38.7	F	12
		59	F	Yes	25-Jan	Fence	46.9	F	12
		53	F	Yes	30-Jan	Fence	43.2	F	17
		58	F	Yes	30-Jan	4	43.2	F	17
		52	F	Yes	23-Jan	Fence	39.8	F	10
		55	F	Yes	10-Feb	Fence	44.9	M b	28
18-Jan	Fence	59	M	Yes	27-Jan	Fence	45.6	M	9
25-Jan	Fence	59	F	Yes	27-Jan	4	45.7	F	2
		47	M	Yes	30-Jan	3	38.6	F b	5
		51	F	Yes	16-Feb	2	40.7	F	22
		59	M	Yes	06-Feb	Fence	41.6	M	12
		47	M	Yes	08-Feb	Fence	37.0	M	14
		60	F	Yes	27-Jan	3	44.6	F	2
		54	F	Yes	30-Jan	Fence	44.2	F	5
26-Jan	Fence	46	F	Yes	01-Feb	4	36.2	F	6
27-Jan	Fence	64	F	Yes	01-Feb	3	48.2	M b	5
		50	F	Yes	06-Feb	Fence	41.3	F	10
		50	F	Yes	01-Feb	4	40.3	F	5
		57	F	Yes	10-Feb	3	36.8	F	14
		56	F	Yes	01-Feb	3	n/r	M b	5
		54	M	Yes	30-Jan	4	41.1	M	3
		50	F	Yes	06-Feb	1	40.3	F	10
30-Jan	Fence	49	M	Yes	08-Feb	Fence	39.1	M	9
		62	M	Yes	01-Feb	Fence	47.7	M	2

Females initially identified as male: 7 (14.0%)
Males initially identified as female: 4 (26.7%)

Mean: 15
Maximum: 28
Minimum: 2

Mean before 15-Jan: 18
Mean after 15-Jan: 8

a. Section locations: 1 - from wet bridge training pond to south branch.
2 - south branch.
3 - from south branch to middle branch, including middle branch.
4 - north branch.

b. Incorrect sex identification during disk tag application.

Appendix 31. Summary of live observations and dead counts of coho salmon in Salwein Creek, 1983-84.

Date	Live count	Dead recoveries							
		Adipose Present			Adipose Absent			Total adults	Adults with disk tags
		Male	Female	Jack	Male	Female	Jack		
05-Dec a	-	-	-	-	-	-	1	0	-
14-Dec a	-	-	-	-	-	-	2	0	-
31-Dec a	-	-	-	-	-	3	-	3	-
08-Jan a	-	-	-	-	2	2	10	4	-
09-Jan a	122	-	-	-	3	2	2	5	-
12-Jan a	-	-	-	-	-	-	6	0	-
13-Jan	125	3	2	-	1	9	-	15	-
17-Jan	194	1	4	-	8	16	1	29	3
18-Jan	65	1	2	-	2	6	-	11	1
20-Jan	90	5	4	1	11	19	-	39	-
23-Jan	70	1	1	-	8	14	-	24	7
25-Jan	80	2	-	-	13	10	-	25	9
27-Jan	102	2	-	-	15	12	-	29	7
30-Jan	69	3	1	-	8	10	-	22	8
01-Feb b	87	3	3	-	10	35	-	51	18
03-Feb	65	2	-	-	6	8	1	16	2
06-Feb	31	1	5	-	26	29	-	61	10
08-Feb	21	2	1	-	8	7	-	18	2
10-Feb	22	3	1	-	7	9	-	20	2
13-Feb	29	-	-	-	2	1	-	3	-
16-Feb	34	1	-	-	2	6	-	9	1
Total	-	30	24	1	132	198	23	384	70

a. Recovered at fence site only.

b. Includes one male and one female (adipose absent) recovered without heads.

Appendix 32. Recoveries of disk tagged and untagged coho adults at the Salwein Creek fence and on the spawning grounds, 1983-84.

	Recovered at the fence						Recovered on the spawning grounds					
	Disk Tag Present			Disk Tag Absent			Disk Tag Present			Disk Tag Absent		
Date	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
05-Dec a	-	-	0	-	-	0	-	-	0	-	-	0
14-Dec a	-	-	0	-	-	0	-	-	0	-	-	0
31-Dec a	-	-	0	-	3	3	-	-	0	-	-	0
08-Jan a	-	-	0	2	2	4	-	-	0	-	-	0
09-Jan a	-	-	0	3	2	5	-	-	0	-	-	0
12-Jan a	-	-	0	-	-	0	-	-	0	-	-	0
13-Jan	-	-	0	-	-	0	-	-	0	4	11	15
17-Jan	-	-	0	-	-	0	3	-	3	6	20	26
18-Jan	-	-	0	-	-	0	-	1	1	3	7	10
20-Jan	-	-	0	-	-	0	-	-	0	16	23	39
23-Jan	-	3	3	1	1	2	1	3	4	7	8	15
25-Jan	2	5	7	10	3	13	-	2	2	3	-	3
27-Jan	1	1	2	1	2	3	1	4	5	14	5	19
30-Jan	-	4	4	2	2	4	2	2	4	7	3	10
01-Feb	1	7	8	1	3	4	2	8	10	9	20	29
03-Feb	-	1	1	2	-	2	-	1	1	6	6	12
06-Feb	2	2	4	4	2	6	-	6	6	21	24	45
08-Feb	2	-	2	2	2	4	-	-	0	6	6	12
10-Feb	1	-	1	2	1	3	-	1	1	7	8	15
13-Feb	-	-	0	-	-	0	-	-	0	2	1	3
16-Feb	-	-	0	-	-	0	-	1	1	3	5	8
Total	9	23	32	30	23	53	9	29	38	114	147	261

a. Recovered prior to the release of disk tags.

Appendix 33. Disk tag incidence and spawning success in coho adult carcasses recovered at the Salwein Creek fence site and on the spawning grounds, 1983-84.

Recovery location	Number recovered	Percent disk tagged	Number females recovered	Percent spawning success
Fence site	85	43.8	46	16.1
Spawning grounds	299	12.7	156	93.0

Appendix 34. Incidence of disk tags recovered by time period on the Salwein Creek spawning grounds, 1983-84.

Recovery period	Total recoveries	No. with disk tags	%
09-Jan to 15-Jan	15	0	0.0
16-Jan to 22-Jan	79	4	5.1
23-Jan to 29-Jan	48	11	22.9
30-Jan to 05-Feb	66	15	22.7
06-Feb to 12-Feb	79	7	8.9
13-Feb to 19-Feb	12	1	8.3
Total	299	38	12.7

Appendix 35. Summary of disk tag application and recovery by fish size in Salwein Creek, 1983-84.

Nose-fork length (cm)	Disk tags applied			Disk tags recovered			%
	Male	Female	Total	Male	Female	Total	
41-45	2	4	6	1	1	2	33.3
46-50	7	20	27	1	6	7	25.9
51-55	17	37	54	5	11	16	29.6
56-60	10	17	27	1	8	9	33.3
61-65	5	8	13	1	2	3	23.1
66-70	-	1	1	-	1	1	100.0
Total	41	87	128	9	29	38	29.7

Appendix 36. Sex composition of disk tag application and spawning ground recovery samples in Salwein Creek, 1983-84.

	Disk tag application sample		Spawning ground recovery sample	
	Recovered	Not recovered	Disk present	Disk absent
Percent males	23.7	35.6	23.7	43.7
Percent females	76.3	76.3	76.3	56.3
Sample size	38	90	38	261

Appendix 37. Summary of disk tag application and recovery results by sex and adipose clip status of coho salmon in Salwein Creek, 1983-84.

	Disk tags applied a	Carcasses examined	Disk tag recoveries			Disk Tag Recovery Rate (%)
			Secondary mark only	Disk tag	Total	
Adults:						
- Males	43	123	0	9	9	20.9
- Females	86	176	0	29	29	33.7
- Total	129	299	0	38	38	29.5
- Adipose Present	1	44	0	0	0	0.0
- Adipose Absent	128	255	0	38	38	29.7
- Total	129	299	0	38	38	29.5

a. Corrected for sex identification error.

Appendix 38. Observed and estimated coho adult escapement by CWT code in Salwein Creek, 1983-84.

Return year	Estimated total adipose clipped escapement	Number of adipose clips recovered	Observed codes						Escapement	
			02 21 15 (Wild)	02 21 14 (Cultured)	02 22 46 (Cultured)	02 22 31 (Cultured)	No tag	Tag lost	02 21 15 (Wild)	Combined cultured
1983-84	859	330	181	54	61	1	11	22	506	324

Appendix 39a. Sex and age composition and mean postorbital-hypural plate lengths of wild coho salmon recovered in Salwein Creek, 1983-84.

Age	Sex	Adipose present			Code 02 21 15			Total		
		Sample size	Mean length (cm)	s	Sample size	Mean length (cm)	s	Sample size	Mean length (cm)	s
4/3	Male	1	35.9	-	0	-	-	1	35.9	-
	Female	0	-	-	1	41.2	-	1	41.2	-
3/2	Male	16	43.3	3.64	60	42.9	3.77	76	43.0	3.74
	Female	4	41.8	3.70	53	42.7	3.72	67	42.5	3.72
2/2	Male	1	24.8	-	0	-	-	1	24.8	-
Total	Male	28	42.4	5.57	83	43.1	3.98	111	42.9	4.43
	Female	22	42.9	3.74	81	42.7	3.61	103	42.7	3.64

Appendix 39b. Sex composition and mean postorbital-hypural plate lengths of wild and cultured coho adults recovered in Salwein Creek, 1983-84.

	Male			Female			Total		
	Sample size	Mean length (cm)	s	Sample size	Mean length (cm)	s	Sample size	Mean length (cm)	s
Wild coho:	110	43.1	4.10	103	42.7	3.64	213	42.9	4.05
Cultured coho:									
Code 02 21 14	17	41.2	4.20	34	41.3	2.79	51	41.3	3.27
Code 02 22 46	14	44.2	5.79	37	43.2	3.61	51	43.5	4.30
Code 02 22 31	0	-	-	1	46.3	-	1	46.3	-
Total	31	42.6	4.98	72	42.3	3.24	103	42.4	3.82

Appendix 40. Daily fence trap catches of coho salmon in the Campbell River, 1983-84.

Date	Adipose Present		Adipose Absent		Catch	
	Adult	Jack	Adult	Jack	Total	Cum.
01-Oct	-	-	-	-	0	0
02-Oct	-	-	-	-	0	0
03-Oct	-	-	-	-	0	0
04-Oct	-	-	-	-	0	0
05-Oct	-	-	-	-	0	0
06-Oct	-	-	-	-	0	0
07-Oct	-	-	-	-	0	0
08-Oct	-	-	-	-	0	0
09-Oct	-	-	-	-	0	0
10-Oct	-	-	-	-	0	0
11-Oct	-	-	-	-	0	0
12-Oct	-	-	-	-	0	0
13-Oct	-	-	-	-	0	0
14-Oct	-	-	-	-	0	0
15-Oct	-	-	-	-	0	0
16-Oct	-	-	-	-	0	0
17-Oct	-	-	-	-	0	0
18-Oct	-	-	-	-	0	0
19-Oct	-	-	-	-	0	0
20-Oct	1	-	-	-	1	1
21-Oct	3	11	-	1	15	16
22-Oct	61	193	64	7	325	341
23-Oct	2	7	3	-	12	353
24-Oct	-	1	-	-	1	354
25-Oct	-	1	-	-	1	355
26-Oct	-	3	2	-	5	360
27-Oct	-	-	-	-	0	360
28-Oct	-	-	-	-	0	360
29-Oct	4	3	1	-	8	368
30-Oct	179	363	238	10	790	1158
31-Oct	81	114	109	8	312	1470
01-Nov	16	16	48	1	81	1551
02-Nov	83	125	119	10	337	1888
03-Nov	224	125	261	5	615	2503
04-Nov	40	26	36	2	104	2607
05-Nov	16	7	10	-	33	2640
06-Nov	4	-	3	-	7	2647
07-Nov	6	1	1	-	8	2655
08-Nov	1	-	-	-	1	2656
09-Nov	-	-	1	-	1	2657
10-Nov	-	1	1	-	2	2659
11-Nov	8	6	3	1	18	2677
12-Nov	4	1	3	-	8	2685
13-Nov	1	2	1	-	4	2689
14-Nov	15	2	6	-	23	2712
15-Nov	25	17	27	1	70	2782
16-Nov	35	11	21	1	68	2850
17-Nov	20	7	10	-	37	2887
18-Nov	8	2	1	-	11	2898
19-Nov	1	-	4	-	5	2903

Appendix 40. Daily fence trap catches of coho salmon in the Campbell River, 1983-84.

	Adipose Present		Adipose Absent		Catch	
Date	Adult	Jack	Adult	Jack	Total	Cum.
20-Nov	6	2	1	-	9	2912
21-Nov	1	-	-	-	1	2913
22-Nov	-	-	-	-	0	2913
23-Nov	-	-	-	-	0	2913
24-Nov a	3	-	1	-	4	2917
25-Nov a	5	-	1	-	6	2923
26-Nov	5	-	-	-	5	2928
27-Nov	-	-	-	-	0	2928
28-Nov	1	-	-	-	1	2929
29-Nov	-	-	-	-	0	2929
30-Nov	-	-	-	-	0	2929
01-Dec	-	-	-	-	0	2929
02-Dec	-	-	-	-	0	2929
03-Dec	-	-	-	-	0	2929
04-Dec	-	-	-	-	0	2929
05-Dec	-	-	-	-	0	2929
06-Dec	-	-	-	-	0	2929
07-Dec	-	-	-	-	0	2929
08-Dec	-	-	-	-	0	2929
09-Dec	-	-	-	-	0	2929
10-Dec	-	-	-	-	0	2929
11-Dec	-	-	-	-	0	2929
12-Dec	1	-	-	-	1	2930
13-Dec	7	1	1	-	9	2939
14-Dec	12	2	4	-	18	2957
15-Dec	5	-	-	-	5	2962
16-Dec	-	-	-	-	0	2962
17-Dec	-	-	-	-	0	2962
18-Dec	-	-	-	-	0	2962
19-Dec	-	-	-	-	0	2962
20-Dec	-	-	-	-	0	2962
21-Dec	-	-	-	-	0	2962
22-Dec	-	-	-	-	0	2962
23-Dec	-	-	-	-	0	2962
24-Dec	-	-	-	-	0	2962
25-Dec	-	-	-	-	0	2962
26-Dec	-	-	-	-	0	2962
27-Dec	-	-	-	-	0	2962
28-Dec	-	-	-	-	0	2962
29-Dec	-	-	-	-	0	2962
30-Dec	1	-	1	-	2	2964
31-Dec	3	-	4	-	7	2971
01-Jan	-	-	-	-	0	2971
02-Jan	5	-	2	-	7	2978
03-Jan	3	-	-	-	3	2981
04-Jan	-	-	-	-	0	2981
05-Jan	-	-	-	-	0	2981
06-Jan	1	1	-	-	2	2983
07-Jan	-	-	-	-	0	2983
08-Jan	1	1	-	-	2	2985

Appendix 40. Daily fence trap catches of coho salmon in the Campbell River, 1983-84.

	Adipose Present		Adipose Absent		Catch	
Date	Adult	Jack	Adult	Jack	Total	Cum.
09-Jan	-	-	-	-	0	2985
10-Jan	4	-	-	-	4	2989
11-Jan	-	-	-	-	0	2989
12-Jan	-	-	-	-	0	2989
13-Jan	-	-	-	-	0	2989
14-Jan	-	-	-	-	0	2989
15-Jan	-	-	-	-	0	2989
16-Jan	-	-	-	-	0	2989
17-Jan	-	-	-	-	0	2989
18-Jan	-	-	-	-	0	2989
19-Jan	-	-	-	-	0	2989
20-Jan	-	-	-	-	0	2989
21-Jan	-	-	-	-	0	2989
22-Jan	-	-	1	-	1	2990
23-Jan	-	-	-	-	0	2990
24-Jan	-	-	-	-	0	2990
25-Jan	-	-	-	-	0	2990
26-Jan	1	-	-	-	1	2991
27-Jan	-	-	1	-	1	2992
28-Jan	-	-	-	-	0	2992
29-Jan	2	-	-	-	2	2994
30-Jan	-	-	-	-	0	2994
31-Jan	-	-	1	-	1	2995
01-Feb	-	-	-	-	0	2995
02-Feb	-	-	-	-	0	2995
03-Feb	-	-	-	-	0	2995
04-Feb	-	-	-	-	0	2995
05-Feb	-	-	-	-	0	2995
06-Feb	-	-	-	-	0	2995
07-Feb	-	-	-	-	0	2995
08-Feb	-	-	-	-	0	2995
09-Feb	1	-	-	-	1	2996
10-Feb	-	-	-	-	0	2996
11-Feb	-	-	-	-	0	2996
12-Feb	-	-	-	-	0	2996
13-Feb	-	-	-	-	0	2996
14-Feb	-	-	-	-	0	2996
15-Feb	-	-	-	-	0	2996
Total	906	1052	991	47	2996	2996

a. Fence out due to high water.